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Heat-Conducting Power of Metals.

Professor Grace Calvert and Mr. Johnson, of England, have been for some time engaged in a series of experiments to determine the relative heat-conducting power of metals in a perfectly accurate and reliable manner, in order that a standard might be obtained from which calculations could in future be made, as the present recorded numbers are varied and uncertain. Their results we publish, although we do not fully endorse them, for we believe that the power of any metal to conduct any one of the forces depends more upon its molecular arrangement than upon its other metallic characteristics, and that until the physical differences in bodies of the same chemical composition are understood and explained, no true standard can be acknowledged.

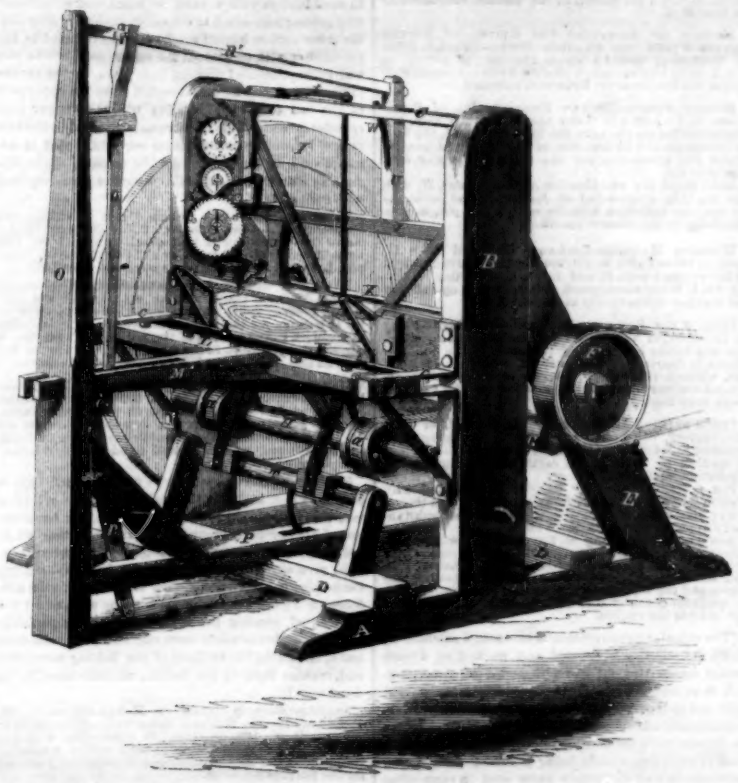
The relative conductibility (taking silver at 1000) of the several metals is—gold pure, 981; gold with 1 per cent of silver, 840; copper rolled, 845; copper cast, 811; mercury, 677; aluminum, 665; zinc rolled, 641, zinc, cast vertically, 628, zinc, cast horizontally, 608; cadmium, 577, malleable iron, 436, tin, 422; steel, 397, platinum, 380, sodium, 365, cast-iron, 359, lead, 287, antimony, cast horizontally, 215, antimony, cast vertically, 192, bismuth, 61.

Australian Quartz Mining—Smelting.

We learn from our very able exchange, *The Colonial Mining Journal*, (Melbourne), that a Mr. J. McBean, of that city, has brought forward a method of gold quartz smelting, which has been several times presented to us for fusing sand and alkalies to make glass by the heat of the sun. It consists in employing the old means whereby Archimedes set a Roman fleet on fire at Syracuse, in Sicily, namely, *burning glasses*, and we are told that a company is in the course of formation to test the invention. There is nothing new in the idea of applying *lenses* to concentrate the sun's rays; but this application of them to the fusing of gold quartz is entirely novel. At the same time, we must say it is impracticable in every sense. Quartz is too refractory to be melted by such an agency; the diamond has been set on fire with a powerful lens, but we are not acquainted with a single instance of quartz being melted by such means.

Quartz-mining has become very common in Australia, the steam-engine being employed for operating the stampers and other machinery. Experiments have been made in calcing the quartz in a furnace prior to crushing it, but the expense is stated to be greater than by the old method of stamping the quartz direct from the mine.

PEFLEY'S LATH MACHINE.



The subject of this engraving is a lath-machine, which not only cuts the laths from the bolt, but also registers the number cut and gives warning when a certain number have been rived off, and it is automatic in its feeding and discharging arrangements. By reference to the engraving the following description of the operation will be understood.

The bolt is made the proper dimensions and its ends are placed in guides, and power being applied to the wheel and shaft, F, a reciprocating motion will be given to the knife, K, by means of rods and eccentrics. This knife is attached to a bar, L, that moves in guides, *c*, The small rods, *k k*, also have a reciprocating motion imparted to them from the shaft of F, which operates the swinging frame, X J V, to which they are attached. The knife works in line with the lower edge of the bar against which the bolt is placed, and when the knife moves outward from the bolt, the small bars, *k*, follow it and hold up the bolt, and they remain in that position until the knife comes back to the bolt and cuts off a lath the thickness of the distance between its edge and the top of the small bars, *k*. The laths fall by guides, as they are cut, on to endless bands, *a*, that pass round pullies on the shafts, H G, and are conveyed away. The bolt feeds itself by its own gravity, and when one is nearly cut up another is laid upon the top guides with the best edge down, to prevent the cutting of any bad laths, and the instant the good wood is all cut up, the operator should move the lever Q, forward, as the knife withdraws, and by this movement through R′ and U, the vibrating frame, V J X and consequently the bars, *k*, are withdrawn from under the bolt which drops away; the guides also being operated by a lever, R, connected at *s* to a link, S, and a vibrating center, T, on which they are placed, so as to throw the bolt away from the good laths. The bars, *k*, fall back to their proper position by the spring, W, when Q is released.

The numbering and registering device consists of three wheels A′, with indexes on their faces and teeth on their periphery, the lower one indicating units, the next hundreds and the third, thousands; a pawl, *s*, attached to the frame, V, moves the wheels, and it is allowed to remain in contact with the teeth by the bolt pressing against a little catch, *u*, that by a link releases the lever, *t*, and so allows the registering device to work, and the same lever, *t*, when there is no bolt in the machine elevates *s*, and no matter though the machine be moving, if it is doing no work none is registered. When a hundred laths are cut (the required number to form a bundle) a small bell is struck, so that the workman has only to take up all that are on the belts, *a*, and he will be sure to have the right number. The knife, K, is prevented from shaking, by a bar, M′, that works through slots in the upright, O, it being attached to the back of the knife bar, L. The upright, O, is connected with the main frame, A B C D E, by a piece, P, and suitable stays or straps.

This machine will cut laths of any length to suit the different spaces in buildings, and as it rejects the bad timber without cutting it, time and wood are thus saved, and we hear from persons who have seen it in operation that it is in every way an excellent and economical device. The inventor is Jacob Pefley, of Bainbridge, Ind., from whom all further information can be obtained. It was patented Dec. 28, 1858.

Howell's Homogeneous Metal.

This new form of the useful metal, iron, is coming into very general use in Great Britain, and deserves the attention of our own countrymen. We have on various occasions mentioned it, but as we had the other day an opportunity of witnessing a practical test of its vast superiority in point of toughness and flexibility over other forms of iron, we wish to record the fact. The articles were drawn tubes of two, three and four inches in diameter, of only half the thickness of wrought iron tubes of the same diameter, and we saw their ends hammered in, cold, from opposite sides, and again at right angles, until a perfect cross-lap was formed, the tube being closed up at the end, and there was no sign of a crack or flaw in any part. With great difficulty we had a two-inch tube broken, and carefully examined the arrangement of the particles of the metal. It seems neither positively crystalline or positively fibrous, but is an even structure, the particles being laid closely to each other, well meriting the name of "homogeneous metal." A broken sheet and bar that we examined presented the same characteristics—an equality in the arrangement of the particles, and an equal toughness in every part—which peculiarly fit it for all purposes where lightness and strength combined are required.

An Invention Wanted for Australia.

MESSRS. EDITORS:—There is a great want in our mining districts of a pump for the purpose of draining our deep quartz claims, from 200 to 300 feet deep, to be worked from the top surface of the ground. Almost every known combination of force and suction pump has been tried here, but none of them have given satisfaction.

We do not know that such a pump can be constructed by even American genius, but we would like to see your countrymen turn their attention to an article so much needed here. Their success would insure them a fortune here.

We propose, if you can secure such a pump, to take out a patent here at our expense, and introduce them throughout these colonies, taking one half profits, and we will furnish the capital for their manufacture either here, in England, or the United States. Will you give it your attention?

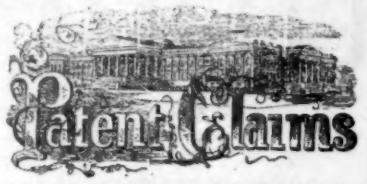
Yours, respectfully,
FISHER, RICARDS & Co.

Melbourne, Australia, Feb. 15, 1859.

[We received the above letter a few days since, *viâ* Marseilles and London. We present it without comment.—EDS.

New Cement Wanted.

The shells of pearl-oysters and such other fish exhibit the most beautiful colors and brilliant polish, and at the same time they are exceedingly hard and durable. These shells are manufactured by the creatures whose houses they form, and the materials of which they are composed were no doubt once in a cold pasty condition, and gradually became indurated. Will art ever be able to rival these humble works of nature? Such an accomplishment is by no means impossible. A cement which could be applied in a cold liquid state, and become hard and shining as polished marble would be a great acquisition to the useful and ornamental arts. Such a cement could be employed to coat the walls of houses, inside and out; to ornament furniture, line cisterns, and to a thousand other purposes. The composition of shells is carbonate of lime and isinglass. Who will be the first inventor to imitate those little creatures of the sea in the discovery of a composition which will be equally as beautiful and enduring as the interior of a pearl-oyster or the exterior of some species of snails?



Issued from the United States Patent Office
FOR THE WEEK ENDING APRIL 26, 1859.

[*Reported officially, for the Scientific American.*]

*** Circulars giving full particulars of the mode of applying for patents, size of model required, and much other information useful to inventors, may be had gratis by addressing MUNN & CO., Publishers of the SCIENTIFIC AMERICAN, New York.

STOVES—R. W. Belcon, of Philadelphia, Pa.: I claim the semi-circular heater, a, turning upon the hollow axis, b, near to one side of the heater, arranged and combined with the stove in the manner set forth.

I also claim combining said heater by means of collar, c', with the air-chamber in rear of the fire-back, as set forth.

STOVES—R. W. Belcon, of Philadelphia, Pa.: I claim the arrangement of the air heater, a, sliding over the oven top and connected with the air passage, b, in the manner and for the purposes set forth.

I also claim making the damper, i, and its shaft hollow, in the manner and for the purposes set forth.

ANIMAL TRAPS—A. S. Blake, of Waterbury, Conn.: I claim, as an improved article of manufacture, a trap having its spring, D, attached below the jaws, e e, and the spring brought within or nearly within the diameter of the jaws, as and for the purposes shown and described.

[This invention relates to an improvement in that old and well-known form of trap termed "steel-trap," and consists in a peculiar modification of the spring and shank and spring bar, whereby the trap is rendered more portable and far more efficient than usual.]

SCREW WRENCH—Albert D. Briggs, of Springfield, Mass.: I make no claim to a nut and screw applied to the movable jaw and main bar of a wrench, and for the purpose of operating or moving the said jaw relatively to the stationary jaw; nor do I claim the invention or improvement which constitutes the subject of the said patent of the said Merrick; nor do I claim the mode of operating the movable jaw, as shown in the patent of D. H. Chamberlain, dated March 20, 1849, wherein the tubular handle has a screw formed within it and rotates on the shank without having any longitudinal motion thereof, and furthermore, such rotary handle is not a separate and distinct thing with reference to the handle, G, as described, as appertaining to my improved wrench. There are important differences between my improvement and the other inventions as cited.

But I claim the application of the sleeve, G, to the nut, F, and the handle, D, so as to not only to be capable of turning with and rotating the nut, but of moving longitudinally on the handle and with the nut, in accordance with the movement of the movable jaw, E, on the shank, A.

DISHES FOR WAXING THREAD—Geo. A. Brigham, of Marlborough, Mass.: I claim the combination of the guard, I, the dripper, G, and the guides, B, with the two wires, D and D', to be placed in the dish to hold the thread, in the manner and for the purposes as set forth and described.

SUGAR MILLS—John S. Brown and A. C. Greenleaf, of Indianapolis, Ind.: We claim the combination and arrangement of the rods, K K N N, levers, L L, and bearings, J J, with the set screws, O O, when constructed and operated substantially as and for the purposes set forth.

STEAM-ENGINES—Wm. W. Burgoyne, of Washington, D. C.: I claim, first, The employment of the following elements, in combination, for the accomplishment of the described object, to wit, a water jacket, D D', open to the atmosphere, enclosing the fire chamber, piston chamber and smoke stack, a steam-evaporating plate, B, forming the crown plate of the fire-box, a supply pump, H, for jetting in the water upon the evaporating plate, and a piston, F, which is hung or arranged so as to reciprocate in the path of a circle or in a straight line when operated upon by the evaporating steam, and in its movement operate the driving shaft of an engine, substantially as and for the purposes set forth.

Second, The manner described of making steam between an intensely heated plate, piston, and the isolated or comparatively cool sides of the piston chamber, substantially as and for the purposes set forth.

[This is a novel way of making steam. It renders the use of a boiler to make and contain steam useless. It uses up the steam as fast as made, and employs the expansive force of the same directly to work the piston. This invention may create a sensation in the working of steam, but for the present the inventor wishes it to be passed by without comment.]

MARINE GOVERNORS FOR STEAM-ENGINES—James L. Cathcart, of Georgetown, D. C.: I claim regulating the supply of steam to marine steam-engines by means of a pendulum, arranged and operated in the manner substantially as described and for the purposes set forth.

HARVESTING MACHINES—Geo. Chamberlin and W. Chamberlin, of Olean, N. Y.: We claim the combination and arrangement of the gathering fingers, I, and knives, H, with the reel, L, arms, M, receiver, M', and dischargers, N, when the several parts are constructed and operated as specified.

DEVICES FOR STARTING RAILROAD CARS—David Cumming, of Sorrel Horse, Pa.: I do not claim the use of ratchet wheels or pawls.

But I claim, first, In combination with the ratchet wheels, D, the ratchet bars, E, arranged and operating as described for the purpose set forth.

Second, So arranging the ratchet bars, L, with the sliding frame to which the power is applied, as that said bars will be capable of slight play, up and down, when in clutch with their wheels, and will run entirely out of contact with said wheels without the aid of other mechanism, as described for the purpose set forth.

MODE OF CONNECTING AND SUPPORTING RAILROAD RAILS—M. O. Davidson, of New York City: I claim the use of a rail having its lower web cut away for about 15 inches at the ends, in combination with the use of a bridge rail splice, of a form suitable to receive and support securely the stem of the rail after its lower web has been cut away, and of a length of about 30 inches, or of the distance from centre to centre of crop ties at the ends of the rails, substantially in the manner and for the purpose set forth.

COTTON PRESS—Thos. F. de Bruler, of Rockport, Ind.: I claim the construction and arrangement of the eccentrically-operated gear racks, h h h h2 h2 h2, with the connecting rod or yoke, X X Y Y, Figs. 1 and 2, as described.

I also claim the combination of the said devices, with the plunger or follower, u u u, substantially as set forth and described.

I also claim the construction and arrangement and combination of the traversing pinion, P2, with the sliding carriage, q q r r s s, and driving lever or arms, W W W W, substantially as set forth and described.

MODE OF CONNECTING STRUNG PEARL JEWELRY—Henry Duboscq, of Philadelphia, Pa.: I claim connecting the mother-of-pearl or plates of other material used to form the foundation on which the pearls are strung, substantially as described, for the purpose as set forth.

LOW WATER ALARM FOR STEAM BOILERS—Selah Dustin, of Detroit, Mich.: I claim, in combination with a steam cylinder located inside of a steam boiler, and having two openings in it, a float and rod carrying or operating two valves in equilibrio, and having no packed joints, substantially as described, by which means I avoid all undue pressure and friction, and render the float more sensitive to any variation of the hight of the water in the boiler, and thus obtain a more reliable indication or signal than by any of the heretofore-essayed plans, as set forth.

BREECH-LOADING FIRE-ARMS—Willard C. Ellis, of Springfield, Mass.: I claim the cere, E, having the double action of firing the pistol and unlocking the hook, F.

I also claim the lever, P, in this or any other form, substantially the same, in combination with the lugs on the hammer, as shown in the drawings, or with lugs on the sides of the pistol frame.

I further claim the cocking of the pistol by the act of breaking down the barrel, in the manner substantially as described.

METHOD OF ADJUSTING THE KNIVES OF ROTARY CUTTER HEADS FOR PLANING WOOD—Benaiah Fitts, of Worcester, Mass.: I claim placing the bolt, F F, *Fig.* 2, or its equivalent, under the knife, to operate or adjust the knives as set forth and described.

ROTARY PUMPS—Truman Freeman, Jr., of Providence, R. I.: I do not claim the cylindrical case, the drum moving on the axle, the fixed abutment, the flaps or pistons hinged to the rim of the drum and passing under the abutment, nor the raising of water by a rotary pump.

But I claim the combination of the pistons, H, with the dogs, Q, constructed as described, and arranged for conjoint operation with the cam, I, and pin, K, substantially in the manner specified.

WASHING MACHINE—Lockwood Gail and John H. Gail, of West Falls, N. Y.: We claim the arrangement of the vertical post, F, and lever, E, with the rubber, the whole being constructed, arranged and operated in the manner substantially as described.

SPRINGS FOR RAILROAD CARS AND CARRIAGES—Perry G. Gardiner, of New York City: I claim the construction of a spring by confining the ends of the exterior blades in bearings in the ends or heads of a tension bar, without rivets, bolts, hinges, pins or screws, arranged and operating in the manner and for the purposes described.

STEAM-SPADING MACHINES—J. W. Goodell, of East Wallingford, Vt.: I am aware that spades have been attached to rotating wheels or cylinders for the purpose of spading or turning the earth, and I do not claim, separately, such device.

But I claim, first, The wheels, H, provided with spades, I, in connection with the clearers, J, and the rotating plates, h, arranged for joint operation substantially as and for the purpose set forth.

Second, The attaching of the frame, A, which contains the wheels, H, to a traction engine by means of a universal joint, B, in connection with the gearing, E D, and shaft, C, substantially as shown, whereby the frame and the wheels, H, are allowed to conform to the inequalities of the ground and the working parts driven direct from the engine.

[The object of this invention is to obtain a machine by which the soil may be turned and worked in a more perfect manner for cultivation than by the usual plow. It is more especially designed for operation on a large scale and to supersede the steam plows that have lately been introduced. The desired object is attained by the employment of a series of wheels attached to a common shaft or axis, the wheels being provided with spades and clearers, and in certain cases used in connection with revolving wings or blades.]

SELF-ACTING APPARATUS FOR WORKING RAILWAY BRAKES—Edouard Guerin, of Paris, France: I claim the forked piece, D, vertical lever, L, provided with balance weight, P, rod, T, and collar, M, when arranged substantially as and for the purpose set forth.

I reserve to myself the right of varying or changing the forms, dimensions and proportions of accessories and matters employed.

SEEDING MACHINES—Stephen R. Hunter, of Cortlandt, N. Y.: I am aware that rotary harrows have been previously devised and arranged in various ways, and that inclined or oblique teeth, k, have been used; I therefore do not claim, irrespectively of the construction and adaptation, a rotary harrow.

But I claim the seed-distributing cylinder, K, with adjustable shell, L, in combination with two or more seed boxes, I J, and rotary harrow, H, substantially as and for the purpose set forth.

[A rotary drag or harrow is combined with a broadcast seed-distributing device, so that the drag is made to conform to the irregularities of the surface of the ground, its rotation insured by the forward motion of the machine, and the seed covered in a proper manner directly after being dropped. The seed can also be distributed in greater or less quantities as desired.]

STEERING WHEEL—David Knowlton, of Camden, Me.: I claim the metal rim or circle, provided with sockets for the wooden arms or spokes of the wheel, substantially as described.

LADIES' COLLAR AND CUFFS—William E. Lockwood, of Philadelphia, Pa.: I claim, as a new article of manufacture, embossed cuffs, collars, and other articles of wearing apparel made of a fabric composed of paper and thin muslin, or its equivalent, pasted together as set forth

WATER METER—Nathan B. Marsh, of Cincinnati, Ohio: I claim, first, The combination of the two side or end measuring chambers, A A' B B', middle piece or stationary cylinders, C C', independent reciprocating interior cylinders, F F', having septums, g g', adjusting rods, E E', and valve box, with its valves and passages, the former actuated by the reciprocating interior cylinders, essentially as set forth, and the latter forming inlet and outlet communications with and from the measuring chambers, all for operation together substantially as specified.

Second, Supporting the reciprocating interior cylinders, F F', on projections formed by the extension inwards of the end flanges, b b, of the stationary cylinders, C C', and packing said reciprocating cylinders by the gaskets, f f, which make tight the joints of the stationary cylinders with the measuring chambers, said gaskets being cupped or bent internally as shown and described.

MACHINE FOR CORRUGATING SHEET METAL—Richard Montgomery, of New York City: I claim the combination of the bevel wheel, h, and bevel pinions, i i, with the sleeve, n, projections, k' k m' m, and fork, p, with the corrugated rolls, H H', and the device for raising and lowering the corrugated roll, H, constructed and arranged in the manner described, whereby a sheet of metal, once entered between the rolls, can be worked back and forth and gradually and evenly corrugated at one heat and by one attendant, as set forth.

MODE OF CHILLING RIMS FOR LOCOMOTIVE WHEELS—Hiram W. Moore, of Jersey City, N. J.: I claim the hollow chilled rim whose inner and outer rims are not only united at the sides or ends thereof, but also united throughout the annulus by means of braces extending from one to the other, for the purpose of strengthening the tread of the wheel and preventing it from cracking or breaking in, substantially as described.

TREATMENT OF VULCANIZED RUBBER—Thos. J. Mayall, of Roxbury, Mass.: I do not claim the use of olive oil in the compositions of what is commonly called hard rubber, as the oil in that composition is used for a different purpose, and has different effects from that which it has in soft or flexible compositions, and is the subject of separate Letters Patents issued to me already; nor do I claim its use in compositions of which emery forms a part, as that is a distinct subject and requires a different treatment and is a distinct invention of my own. I have also invented a peculiar composition for forming gas tubing, in which I use olive oil, and I do not claim that use in this specification.

But I do claim the use of olive oil in compositions of gatta-percha and india-rubber, substantially in the manner and for the purposes described.

REEFING SAILS—Enoch E. Mulliner, of Camden, N. J.: I do not claim, broadly, the invention of the bonnet, as that has been applied to jibs and lug sails.

But I claim the combination of the divided sail, D E or F G, with reef pennants, c, roller clews, b, pulleys, d, and yard or boom, C I, as and for the purposes shown and described.

[This invention consists in the arrangement of the lower part of a square or fore-and-aft sail as a bonnet, in combination with a yard or boom, and with proper reef pennants attached to the sail in such a manner that the lower part or bonnet can be reefed or furled to the yard either with or without the upper part of the sail and while connected thereto, and when furled to the yard or boom, can be disconnected from the upper part of the sail to prevent chafing while the upper part remains spread. This improvement applied to the topsails of large ships accomplishes everything that is accomplished by the use of double topsails, while dispensing with the weight of the two extra yards required with such a rig.]

FASTENING SLATS ON SUGAR CANE AND BAGASSE CARRIERS, &c.—Chas. Neames, of New Orleans, La.: I claim the arrangement and combination of the two jaws, H and I, hinged together at L, by means of hinge pin, L, as and for the purpose shown and described.

RAILS FOR STREET RAILROADS—Saml. Nicolson, of Boston, Mass.: I claim making each bearer not only with a grooved upper surface, but with a projection or lip at bottom, for the purpose of producing uniformity of strength in the section of the rail and of entering a corresponding groove in the stringer, C, and supporting the rail and its spikes or bolts against lateral strains.

MANUFACTURE OF ELASTIC BELTING—S. T. Parmalee, of Edinburgh, Scotland: I claim submitting the belting, while within the heating or vulcanizing chamber, to pressure between the smooth surfaces of an endless metallic band and one of two revolving metallic cylinders round which the said band passes, substantially as set forth.

[Belting for all purposes can be manufactured by this process, which is simply the coating of layers of woven material with india-rubber, gutta-percha, or a combination of both properly prepared for vulcanization, these are united and subsequently subjected to the vulcanizing process. The improvement consists in submitting the belting to pressure between smooth metallic surfaces during the heating or vulcanizing process, for the purpose of causing the layers to be more perfectly united and the materials more effectually consolidated, and of rendering the surfaces of the belting more even and regular than in the belting manufactured in the usual way.]

SHARPENING THE CALKS OF HORSE-SHOES—A. W. Payne, of Morris, N. Y.: I claim the rotary burrs or cutters, B B', one or more, in connection with the bearing plate or plates, C C', placed within a suitable frame or stock, A, and arranged substantially as and for the purpose set forth.

[The object of this invention is to obtain an implement with which the calks of horse-shoes may be sharpened without detaching the shoe from the foot of the horse. The invention is designed for country use and in those cases where the calks are not tempered or hardened, as is necessary in paved cities, in order to prevent the quick wearing of the shoes.]

WATERPROOF LEATHER HOSE—James Punderford, of New Haven, Conn.: I am aware that it is not new to apply india-rubber to cloth, nor to cement cloth to leather by india-rubber cement, nor is it new to cover with india-rubber the interior of a hose made of a woven material; therefore I do not claim such.

But I claim the new or improved manufacture of riveted leather hose, made with a waterproof lining applied to its inner surface and extending between the joint or lapping where such rivits are inserted, substantially as described.

MACHINES FOR RAKING HAY—David Ramler, of Union Depostr, Pa.: I claim the adjustable side bars, A A, provided with the rake heads, J J, and teeth, c, in connection with the rake-head or shaft, B, provided with teeth, p, the above parts being arranged and combined substantially as shown, and used with or without the dividers, b', to operate as and for the purpose set forth.

[The hay, by this device, can be racked direct from the spread state in which it was dried or cured into cocks, thereby avoiding the manual labor of "cocking" the hay from the wind-rows into which the ordinary horse-rakes can only gather it.]

CORN HARVESTERS—Isaac Reamer and Henry Miller, of Conrad's store, Va.: We claim, first, The combination with the vertically adjustable upper guides, G G', of the vertically adjustable reel, D, for action together, as set forth.

Second, The reel, D, constructed with tangentially set tie-bars or guides, K K, as described, in combination with a platform on which the stalks fall parallel with the line of travel, substantially as and for the purposes set forth.

Third, The combination with the frame, A, knife, C2, of the under adjustable frame, A', substantially as and for the purposes set forth.

Fourth, The manner shown and specified of connecting the platform, E, with the frame of the machine, for the purpose set forth.

Fifth, Providing the platform, E, with a slide back extension board, n, in the manner and for the purposes set forth.

Sixth, The arrangement with oblique or diagonal set spring blade or cutter of a fixed obliquely set carrying wheel, C, in the manner and for the purpose set forth.

[This machine cuts down corn or sugar cane with an oblique cut similar to what is done by hand with a knife. The knife can be raised or lowered to suit stiff and tight cutting. The platform can be adjusted to a greater or less length so as to receive corn or cane. The reel arms are set so as to deposit the corn or cane straight upon the platform. The platform swings on a centre so as to be kept horizontal while going down hill, and thus prevent the falling out of the corn; also so that it may be tilted and the corn dumped. The wheels of the carriage are set so as to prevent side draft. We regard this a very perfect machine.]

STOVE POLISH MIXER AND SCRAPER—John C. Reed, of Providence, R. I.: I do not claim any of the parts of the article when used separately.

But I claim the combination of the receptacle, A, scraper, B, and mixer, C, when arranged and operated as described,

MACHINES FOR LAYING HEMP AROUND WIRE IN MAKING ROPE—Jacob Rinek, of Easton, Pa.: I lay no claim to perforated plates for guiding the strands and maintaining them apart, nor do I claim any one or more of the described parts separately and independent of the others.

But I claim the revolving yoke, E, with its hollow spindle, e, and one or more rollers, h, arranged on and turning in the yoke, as set forth, when the said yoke and its appendages are combined with and arranged in respect to the two sets of bobbins, a a, containing the strands of hemp, the perforated guide plates, I and J, and tube, m, substantially as set forth.

SPRING BED-BOTTOM—Isaac A. Sergeant, of Springfield, O.: I claim, first, The arrangement of the stretcher frame, C C C'', and rails, B and D, secured and supported as described, for the purpose set forth.

Second, The supporting legs or stays, F, and racks, G, in the described combination with the frame, C C C'', for the purpose set forth.

Third, The described arrangement of straps, d, and knobs, e, for the purpose explained.

MACHINE FOR ADDRESSING NEWSPAPERS, &c.—George Shuck, of Madison, Ind.: I am aware that there have been previous arrangements for the like purpose of type forms brought under the action of a stamp by means of a slide moving by degrees and operating in connection with a slitted plate for securing to the document the desired impression, and that a traversing bed has been used to bring all the names, numbers or addresses in the form, successively, under an aperture in the tympan and causing the matter placed under the platen to receive the desired impression; such I do not claim.

But what I do claim here is the combination with the hopper, C, which contains the documents to be addressed, of the sliding gate, K, provided with a heel or step and operating to close the hopper discharge, and at intervals to open the same in such manner as to permit of a single document being deposited from the pile in the hopper in front of said heel for after traverse with the gate, substantially as and the purposes specified.

I also claim the combination of the inclined feeding channel, E', main type channel, E, and raised discharge channel, g.

I further claim, in connection with the feed bolt, E², the angle lever, X2, or its equivalent, to aid the type in its course from the feed channel to the main channel of the machine.

I likewise claim the employment of form boxes, H, for use as described, at either end of the machine.

Also the combination with the traversing type or form of a notice bell, or its equivalent, for operation by the type at intervals, as described.

Likewise the combination with the bolster, L, operating essentially as described, of the springs, 84 84, for relieving the type from the paper and holding it on the bolster and type-shifter, G'.

And lastly, The document-discharging fly, X', when operated by the sliding gate, K, essentially as described.

COTTON SCRAPERS—Patrick Sharkey, of Brownsville Miss.: I claim, first, arranging the scrapers, F G, one forward of the other on guide blocks or runners, D E, of different lengths, substantially as and for the purposes set forth.

Second, The arrangement of a sleigh-runner shaped gage with the short scraper E, substantially as and fo the purposes set forth.

[This invention consists in arranging one of two scrapers in a long runner and the other in a short runner, whereby the tendency of the implement to run out of a straight line is avoided. This is a simple contrivance, yet it seems to be just the thing for cultivating the staple production of the South.]

SEWING MACHINES—Thomas Shaw, of Philadelphia, Pa.: I do not claim, broadly, a needle-bar, to which a vertical as well as a horizontal motion is imparted by cams or their equivalents, but I claim the feed-bar, Q, attached to and carried solely by the spring, s, operated vertically by the combined action of the rods, F F, and the aforesaid spring, and horizontally by the combined action of the independently adjustable screws, i, and the same spring, S, and regulated by the screw, R, on the stationary bracket, g, the whole of the above parts being arranged substantially as set forth.

GOVERNOR FOR REGULATING THE SPEED OF STEAM-ENGINES—Thos. Silver, of Philadelphia, Pa. Patented in England, May 23, 1857: I claim the combination of a spring, with a momentum wheel and adjustable speed-limiting vanes, the whole constructed with the combination of the peculiarly adjusted sectors, pinion and links, as fully described and set forth.

DETECTIVE REGISTER FOR DOORS OF RAILROAD CARS—Walter C. Smith, of Georgetown, D. C.: I claim of the opening and closing of car doors by means of the latch or key, in combination with the two index or registering wheels, operated substantially as set forth.

GAS-PIPE CUTTER—Joseph E. Stanwood, of Malden, Mass.: I do not claim a pipe or rod cutter having a chisel with a screw or means of forcing such chisel toward the claw or pipe-rest, but I claim my improved pipe or round rod cutter as provided with a rotary cutting wheel to operate in conjunction with the claw or pipe-rest as specified.

I also claim the arrangement of the cutting-wheel carrier in a recess, C, formed in the claw block, B, in combination with the arrangement of the adjustable screws, d e, and handle rod, F, with respect to the said recess and cutter wheel carrier, the whole being as specified.

SPRING CAR COUPLINGS—Frank Steinhart, of Dansville, N. Y.: I claim, first, The combination of the radial fenders, or their equivalent, arranged as described with the jaws of the nippers, for the purpose set forth.

Second, Constructing the bolt head with an open back, and also with a longitudinal recess in its back, for the purpose described.

MACHINERY FOR ACCUMULATING AND TRANSMITTING POWER—Enos Stevens, of Barnet, Vt.: I claim the endless chain, E C, forming the pendant loops, *E* and C, supported by the wheels, M and W, in combination with the weight, C W T, suspended from a pulley, supported by the loop, E, and the weight or guide pulley, G P, and cord, R, the whole arranged and operated substantially as described.

PUMP BOXES—Francis Stock and John Stock, of San Jose, Cal.: We do not claim the valve, F, nor the valve, C, nor do we claim any parts connected with the lever, B, as novel.

But we claim the arrangements of the parts, j k l, of the box, D, in connection with the bolts or rods, p p, and valve, E, substantially as shown and described.

[This invention consists in a peculiar manner of constructing and arranging the parts of the upper box of the pump in connection with its valve, and the manner of attaching the box to its rod or pole, whereby a very simple box and valvular arrangement is obtained, one that cannot readily get out of repair, and is capable of having proper packing adjusted to it with facility.]

STOP COCKS—Thos. Stubblefield, of Columbus, Ga., assignor to himself and Peter Naylor, of New York City: I claim the combination of the lever, D, cap, I, valve stem, a, and spring, c, when the cap, I, is provided with a semi-circular opening, into which fits the semi-circular end, H, of lever, D, for the purpose of forming a tight joint, without packing, substantially as described.

CARPET FASTENER—James A. Taylor, of Cowlesville, N. Y.: I claim as a new and improved article of manufacture, the hooks, a, and pins, b, arranged and operating in combination with the carpet, as described.

[We have in this invention a very simple, cheap, and efficient carpet-fastener, [which admits of the carpet being readily taken up and put down, and the strain equally distributed over the carpet.]

WRENCH—George C. Taft, of Worcester, Mass.: I claim the screw-threaded rosette, a, with its hole, o, in combination with the stationary guide rod, b, rack, n, traversing male screw, f, and sliding jaw, g h, with its female screw, p, substantially as and for the purposes set forth.

GRINDING MILLS—George Todd, of St. Louis, Mo.: I claim securing the ears of the rim, f, of the stationary stone, A, between a double series of upper and lower springs, m m and k k, whose elasticity is governed and controlled by the series of adjusting screws, n n, substantially in the manner and for the purpose set forth.

PENHOLDERS—Alfred R. Turner, of Malden, Mass.: I claim a penholder constructed with the cover, b, turning on a pivot or fulcrum, and acted upon by the bent spring, e, substantially as described.

And I also claim, in combination with the above, the sliding piece, f, as set forth.

LAMP WICKS—John B. Wortendyke, of Godwinsville, N. J.: I claim, as an improved article of manufacture, a lamp wick composed of strands that have received a preparatory twist in one direction, are then spun in the contrary direction with and coiled upon a thread, c, and are then twisted together, all as shown and described.

[This wick is produced by laying and twisting together a number of strands composed of loose yarns and fine threads, spun in such a manner that all the fibers of the yarn are caused to have in the wick a direction corresponding exactly or nearly with the spiral direction of the strands, and, though kept in a compact state by the fine threads being coiled round them, permit so free a capillary action as to imbibe the melted tallow, oil, or other material, more rapidly than wicks spun or twisted in other ways.]

MACHINES FOR CUTTING AND FOLDING WADDING AND PAPER—John Wood, of Brooklyn, N. Y.: I claim, first, The receiving box, V, provided with two compartments and fly-boards, d', connected with racks, c, and with ratchets, h', actuated by the arms, k, and cam, J, in connection with the wheel, X, and adjustable pinion, OXX, substantially as and for the purpose set forth.

Second, Operating the knife gate, D, and plate, P, by means of the lever, O, provided with the sector racks, j, which gear into the racks, k, of gate, D, and bar, l, so that the knife and plate will be actuated or made to perform their respective functions alternately, as described.

Third, The arrangement of gearing, G I K E, as shown and described, when used in connection with the lever, O, for the purpose of operating the several parts automatically as and for the purpose set forth.

[Endless feed aprons, a folding plate and rollers, a fly and receiving box are employed in this invention, which is designed for cutting and folding wadding paper or any textile or pliant substance which is manufactured in continuous sheets or rolls, and which require to be cut into pieces and folded for after use.]

REFRIGERATOR—Abraham Yost, of New York City: I claim the combination and arrangement of compartments, D and K, dampers, b and J, and escape tubes, L, substantially as and for the purposes set forth.

[The air is admitted around a tight metallic box, which contains the ice, and is conducted through the refrigerator; by this means a very good refrigerator is obtained and the ice economically used.]

CONSTRUCTION OF RAILROADS—John Young, of West Galway, N. Y.: I would remark that I do not claim placing a rail upon a saddle as this device is well known, many examples of which may be referred to; and I therefore disclaim such combination other than my own.

But I claim constructing a rail and saddle, as described, whereby I am enabled to securely hold and render solid the joints or ends of rails during the passage of cars, substantially as described.

I also claim combining with said rail and saddle, as described, the straining arch, E, key, D, and strip, F, for the purpose set forth and specified.

RESTORING WASTE RUBBER—Francis Baschnagel, of Wenham, Mass., assignor to the Beverly Rubber Company, of Beverly, Mass.: I claim the described process, to wit, restoring waste vulcanized rubber by reducing the same, by grinding or otherwise, to a finely divided state, and then submitting the same in a suitable vessel to the direct action of steam.

SOFA BEDSTEAD—K. Borren, (assignor to Peter Schneider,) of New York City: I claim, first, Constructing a sofa bedstead with an interior drawer, which may be pulled and united with the sofa seat, so as to form one bed or couch by the application of ways or grooves, a, to the inside of the sofa frame, substantially as described.

Second, The horizontal rods, F, of the sofa frame in combination with the stay, E, of the interior drawer for the purpose of more securely guiding the said drawer, substantially as described.

Third, Providing the drawer with two back pins, o o, in the manner and for the purpose substantially as described.

STEAM VALVES—Harry H. Evarts, (assignor to himself and Phineas E. Merrihew,) of Chicago, Ill.: I claim the arrangement of the ports, cavities and passages in the valves, substantially as herein described, in combination with a corresponding arrangement of the ports in the seat, whereby a single valve is made to perform its functions for the two cylinders of the engine, as set forth.

[This is an excellent arrangement of a valve, whereby one is made to perform the functions of two.]

HINGE—Levi T. Howell, of Burlington, N. J., assignor to himself and De Witt C. Taylor, of Philadelphia, Pa.: I do not desire to confine myself to any particular form of hinge or to any particular mode of securing the same, nor do I claim, broadly, a hinge with notches and projections to render it self-locking.

But I claim the projection, l, on one half of the hinge, said projection being inclined on one side and abrupt on the other, in combination with the spring bolt, D, and its notch, e, when the said bolt is so fitted to the other half of the hinge as to have a limited vertical, but no turning movement therein, and when the whole of the parts are arranged for joint action, substantially as and for the purpose set forth.

HORSE POWER—Clark Lane, (assignor to Owens, Lane, Dyer & Co.,) of Hamilton, Ohio: I claim the construction and adaptation of the stay rods, F G, with the hooked stand plates, I I, and racks, D E, on the sweep, C, or their equivalents, in combination as set forth.

REGULATOR FOR TIME-KEEPERS—Ralph S. Mershon, (assignor to himself and John M. Harper,) of Philadelphia, Pa.: I claim the application to watches, and such time-pieces as have their vibrations governed by a balance and hair spring, of a compound regulator composed of two or more movable segments, constructed and operating substantially as described.

I also claim the combination of said compound regulator with a greater or lesser scale, the former fixed and the latter movable, but having a fixed indicator and capable of being operated either in concert with, or independently of each other, substantially as described.

SEEDING MACHINES—George W. Richardson, of Grayville, Ill., assignor to himself and John P. Williams, of White County, Ill.: I claim the arrangement of the cam wheel, H, and lever, F, with the seed slide, X, and vibratory bar, E, of the harrow, D D, when the whole are constructed for operation conjointly in the manner and for the purpose set forth.

JOINT FOR GAS AND WATER-PIPES—James E. Quinn, (assignor to John M. Johnston,) of Chicago, Ill.: I claim the arrangement of the rings, e and f, on pipe, d, in combination with the opening, c, in the socket, b, forming the cement chamber, h h, for the purpose of joining pipes air and water-tight by using cements in place of lead commonly used, the whole arranged substantially as set forth.

[This is a very simple and yet effective method of uniting the joints of pipes by cement. The invention consists in providing a groove and shoulder at the junction of two sections of pipe or tubing for receiving and confining the cement. The cement is poured into this groove, and against the shoulder, from the outside of the pipe; and when the groove and the hole through which the cement is poured are filled, it is impossible almost to open the joint, and the cement is kept from exposure to the moisture. The use of lead solder is wholly dispensed with.]

BED-BOTTOM—Leonard B. Tinkham, (assignor to himself and Charles Ryan,) of Lawrence, Mass.: I claim the combination of S-formed springs, arranged so as to receive the movable rivet and retain the slats in place, with bars, B, and stirrups, a b, when the same are arranged substantially for the purposes and in the manner specified.

[There is no room in the joints of this bed-bottom for vermin, and yet it is so constructed that the slats can be readily removed and replaced, and the side rails require no mortising.]

EGG BEATER—John L. Nicolai, (assignor to himself, S. E. Knott and R. F. Farrell,) of Chicago: I claim, first, The within-described beaters, C, arranged with diverging fingers, F, which are attached to disks, E, to operate substantially as and for the purpose set forth.

Second, The arrangement of a series of beaters, constructed as described, on rotary shafts, C, so that the several beaters can be operated, substantially as and for the purpose specified.

[The beaters in this invention are arranged in one frame, so that they can all be operated together and many eggs in different vessels be beaten simultaneously.]

RE-ISSUES.

GRAIN HARVESTERS—Thomas D. Burrall, of Geneva, N. Y. Patented April 5, 1853: I claim, first, The additional apron to convert the usual rear discharge into a side discharge of the cut grain, substantially as described.

I also claim the combination of the curved supports and the adjustable journal box piece to preserve the relative positions of the cogs in the mitre gearing, and at the same time allow of raising and depressing the driving wheel, substantially as described.

I also claim the notches in the back corners of each knife to prevent clogging or lodgment of fine grass in the cavities of the guards, said notches effecting a good purpose and not weakening the cutter, as represented.

GRAIN HARVESTERS—Thomas D. Burrall, of Geneva, N. Y. Patented April 5, 1853: I claim the location of the raker's seat with regard to the drive-wheel and platform as described, and for the purpose set forth.

I also claim in combination with a raker's seat located as described, extending the rear of the platform far enough back to allow the racker from his seat to turn the grain upon the platform, and rake it off in an arc of a circle by a circle by a circular sweep or quarter turn movement of his rake substantially as described.

ARRANGEMENT OF BUCKETS OF PADDLE-WHEELS—Mathew A. Crooker, of New York, N. Y. Patented October 28, 1856: I claim arranging the floats or buckets of a paddle-wheel upon its arms or the equivalent thereof, whereby the buckets shall be continuously increasing and diminishing their depth in the water as the said wheel revolves, as and for the purposes set forth.

MACHINES FOR PEGGING BOOTS AND SHOES—John James Greenough, New York, N. Y. Patented January 17, 1854—Re-issued July 4, 1854—Re-re-issued April 26, 1859: I claim driving the pegs into boots and shoes automatically, by means of a peg-driver operated up and down by a positive mechanical movement whether impelled by a cam, eccentric, or crank, or other equivalent, substantially as and for the purposes specified.

MACHINES FOR PEGGING BOOTS AND SHOES—John James Greenough, of New York, N. Y. Patented January 17, 1854—Re-issued July 4, 1854—Re-re-issued April 26, 1859: I claim the moving of the sole of the shoe along by means of the awl that forms the hole in which the peg is inserted, in combination with the peg-driver, whether the peg-driver be or be not employed to perform the additional function of presenting the peg, whereby each hole made by the awl is brought in succession in line for inserting the peg before the awl is withdrawn as set forth.

MACHINES FOR PEGGING BOOTS AND SHOES—John James Greenough, of New York, N. Y. Patented January 17, 1854—Re-issued July 4, 1854—Re-re-issued April 26, 1859: I claim cutting off shoe pegs from a strip of peg wood or other material, by means of a lateral or side cut, that will cut straight across, substantially as and for the purposes set forth, when combined with suitable ways in which the strip slides, and machinery for driving the pegs as specified.

I also claim inclosing the peg by the cutter, until it is driven as specified, by making the cutter, when in position, a part of the guiding tube substantially as set forth.

I also claim the combination of the endless feed with a cutter for severing the pegs in a shoe-pegging machine as specified.

MACHINES FOR PEGGING BOOTS AND SHOES—John James Greenough, of New York, N. Y. Patented January 17, 1854—Re-issued July 4, 1854—Re-re-issued April 26, 1859: I claim connecting the last with a horizontal slide or plate capable of presenting the shoe or boot, substantially as described, so that the shoe or boot attached thereto may be turned and moved in any direction, in a horizontal or inclined course, in combination with a mechanism, substantially such as described, which tends constantly to force it upward against a rest or guide, but which will permit it to yield downward as described, but this combination I claim only when combined with the pegging mechanism described, or any equivalent therefor.

And I also claim as an automatic means of moving and guiding the last to present it to the pegging apparatus, in the required line of pegging, the guide groove, guide and pinion and curved neck, substantially as described in combination with the mechanism above described, or the equivalent thereof, which permit the last to be moved in any desired direction as set forth.

MACHINES FOR PEGGING BOOTS AND SHOES—John James Greenough, of New York, N. Y. Patented January 17, 1854—Re-issued July 4, 1854—Re-re-issued April 26, 1859: I claim the combination of the universal movement carriage and lateral awl-movement for properly presenting the shoe to receive the pegs in succession as specified.

I also claim the combination of the mechanism for the cutting and feeding of the pegs as herein described or any equivalent therefor, with the automatic peg-driver as described.

I also claim the combination of the following elements or their mechanical equivalents, namely, the peg-former, the peg-feeder, the peg-driver, and the mechanism for moving the shoe, described, thus constituting an automatic machine for pegging shoes as set forth.

MACHINES FOR PEGGING BOOTS AND SHOES—John James Greenough, New York, N. Y. Patented January 17, 1854—Re-issued July 4, 1854—Re-re-issued April 26, 1859: I claim the pegging of boots and shoes with nails or pegs of drawn wire, substantially as described.

I also claim driving the pegs by means of the cutting nippers, said nippers cutting off the peg after it is driven substantially as specified.

TAILOR'S SHEARS—Rochus Heinisch, of Newark, N. J. Patented July 13, 1858: I claim the oblique rectilinear slot, C, in the elongated shank of the lower blade, A, in combination with the fulcrum, D, and a lever connecting with two portions of the shears behind the fulcrum, the whole constructed and operating substantially as and for the purposes described.

MACHINE FOR MAKING PAPER BAGS AND ENVELOPES—North American Paper Bag and Envelope Manufacturing Company, of Philadelphia, Pa., assignees of J. A. Smith, of Clinton, and S. E. Pettee, of Foxborough, Mass. Patented May 1, 1855: We claim, first, The bar, K, to relieve the end of the under sheet of the weights of the pile, partially or wholly.

Second, The friction bar, I, to separate the under sheet.

Third, The guide-bar, L, in connection with the bar, I, to hold the sheet in place for the jaws.

Fourth, The lifter, M, to relieve the sheet from the weight of the pile.

Fifth, The feeding from the bottom of the pile.

Sixth, The combination of the weight bar, friction bar, guide bar and lifter, constituting a feeding apparatus.

Seventh, The jaws to place the paper in position.

Eighth, In combination with machinery for making bags from paper of any size, we claim a former of the shape and dimensions required by the nature of the work to be done, over or around which the paper is to be folded for the purpose of producing the bag or bags substantially as described.

We wish it understood, however, that we distinctly disclaim the use of a series of molds in a machine for making paper boxes, such a series having been used in the paper box machine of R. L. Hawes, patented 16th January, 1855. Nor do we claim molds placed at the extremities of the arms of a wheel, and used in the manufacture of paper boxes, such an arrangement having been employed in the box machine of Louis Koch, patented 13th March, 1855.

Ninth, The pasters and side folders.

Tenth, The combination of the table, the bar, B, the side folders and pasters, all constructed as set forth, or any other substantially the same.

SEWING-MACHINES—Emeline M. Stedman, of Vienna, N. J., (executrix of George W. Stedman, deceased.) Patented December 12, 1854: I claim, as the invention of Geo. W. Stedman, deceased, first, The tube described, receiving thread in the manner specified and acting in combination with the needle, so that each forms a series of loops, each of which loops receives one and is received by the next one of the other series as set forth.

Second, I claim the auxiliary plate carrying the guide for the looping-tube, and secured to the bed-plate substantially in the manner specified, so as to be adjustable to any desired position relatively with the needle, for the purposes set forth.

Third, I claim a reciprocating tube or equivalent device co-operating with an eye pointed needle to concatenate or form the stitch, and produce sewing essentially as specified, combining with and receiving its motion from one end of a lever, the fulcrum of which is at or near the bed or table of the machine while the other end carries the said needle substantially as described.

Fourth, I claim feeding the cloth by means of a needle which is made to pass through the same in a position with respect to its length, diagonal to its line of movement as specified, in combination with a spring to throw the needle into position to feed the cloth the next stitch, and the screw or its equivalent to determine and regulate the length of the stitch, substantially as specified.

GRAIN AND GRASS HARVESTERS—Eliakim B. Forbush, of Buffalo, N. Y. Patented April 17, 1855: I claim, first, The arrangement and connection of the rear cross timber, X, in relation to the main frame in the manner and for the purposes specified.

Second, The peculiar construction and arrangement of the gear frame, B, in relation to the main frame driving-wheel and gearing in the manner and for the purpose specified.

Third, The gear key, D, in combination with the gearing shaft constructed and arranged and operated substantially in the manner described for the purpose specified.

Fourth, The locks, n and p s, in the clamp as and for the purpose set forth.

Fifth, The track-clearer, M m, provided with the arms, y y, arranged in relation to each other, and socket-piece, n, to operate in the manner and for the purpose substantially described.

Sixth, A recess, I X, made in the outside shoe in rear of the outside cutter-bar as and for the purpose specified.

Seventh, The second angle at c r, formed by the brace bars of the guard finger substantially as described.

DESIGNS.

COOK STOVES—Sherman S. Jewitt and Francis H. Root, of Buffalo, N. Y.

TEA-POT, &c.—G. W. Smith, of Hartford, Conn.

ADDITIONAL IMPROVEMENTS.

MACHINE FOR PACKING WOOL—Charles Carlisle, of Woodstock, Vt. Patented October 6, 1857: I claim forming either or both of the leaves B B, of my improved wool, packing machine of two or more connected longitudinal sections, when the said jointed leaves are so arranged as to operate with the other parts of said machine substantially in the manner and for the purpose set forth.

CORN-SHELLERS—Williams Wells, of Boston, Mass. Patented January 4, 1859: I claim the guide, B, in combination with the weighted ar spring presser, C, made movable and adjustable with reference to the centre of the disk, A, in the manner and for the purpose set forth.

EXTENSIONS.

WOODEN BRIDGES—George W. Thayer, of Springfield, Mass. Patented April 22, 1845: I claim the combination of one or more series of iron screw rods, b b, &c., with the suspension posts and chords or string pieces of a truss, in the manner and so as to operate substantially as specified.

I do not claim the combining with the posts, braces, and strings of a truss, a series of supplementary braces, k k, &c.

But I claim the arrangement of such a series of braces upon the outer sides of the truss, and so that they shall extend above and below the chords thereof and be confined to the truss, substantially as described.

MACHINES FOR MAKING MATCH SPLINTS AND ARRANGING THEM IN THE DIPPING FRAMES—Asa Fessenden, of Templeton, and Luke S. Knight, of Barre, Mass. Patented April 26, 1845: We claim the combination with the series of cutters, o, of the passages, e e, &c., leading from the cutters, whether there be one or more series of said cutters and passages, the whole being for the purpose of making match splints from a block or blocks, as described.

Also the combination with the aforesaid cutters and passages of one or more dipping frames, arranged and operating with respect to them, substantially as described.

Also our improved manner of making the dipping frames, viz., in sections of separate pieces or plates, h h h, as described.

Also the combination of mechanism by which each of the blocks of wood is held down upon the carriage, B, and progressively forced forward against the board, F, the said mechanism being applied to the carriage, B, and board, F, and constructed and operating together substantially as set forth.

Also the combination of machinery by which the dipping frames are progressively moved forward, the said machinery being connected with and intervening between the carriage, B, and the said dipping frames, and operating substantially in the manner as explained.

INVENTIONS EXAMINED at the Patent Office, and advice given as to the patentability of inventions, before the expense of an application is incurred. This service is carefully performed by Editors of this Journal, through their Branch Office at Washington, for the small fee of $5. A sketch and description of the invention only are wanted to enable them to make the examination. Address MUNN & COMPANY,

No. 37 Park-row, New York.

Speed of Circular Saws.

MESSRS. EDITORS:—As there is a wide difference of opinion among lumbermen regarding the speed of circular saws, it is a matter of very great importance to those engaged in running saw-mills to know the best speed, under all circumstances, at which such saws should be run. Some sawyers allege that their saws work well only when run at a high speed, while others as confidently assert that they do better at a comparatively low speed. It is thus that mill-men themselves differ in opinion, and there are no settled principles prevailing among them on this subject.

When it is recollected that success in sawing depends entirely on the performance of the saw, the importance of ascertaining the proper speed at which it should be run is a question of no small magnitude. Being interested in the lumbering business, I am desirous to obtain reliable information on this point—will the SCIENTIFIC AMERICAN enlighten me?

S. E. P.

[Our correspondent will find some useful information on the speed of circular saws on page 128 of the present volume of the SCIENTIFIC AMERICAN; but there are so many collateral questions connected with the "best speed of saws," that it is not possible to lay down a precise rule for all cases. Thus, different kinds of timber require different velocities of the saw; and the *set*, the *temper*, and *hang* of the saw in its journal-boxes must all be taken into consideration. A 56-inch circular saw may be safely run at the rate of 4,600 feet per minute, and a smaller one at a still higher velocity.

LONG AND SHORT DAYS.—At Berlin and London the longest day has sixteen hours and a half; at Stockholm, the longest day has eighteen hours and a half; at Hamburg, the longest day has seventeen hours, and the shortest seven; at St. Petersburg, the longest day has nineteen, and the shortest five hours; at Tornea, in Finland, the longest day has twenty-one hours and a half, and the shortest two hours and a half; at Wanderhus, in Norway, the day lasts from the 21st of May to the 22d of July, without interruption; and at Spitzbergen, the longest day is three months and a half.

PICKLED EGGS.—At the season of the year when eggs are plentiful, boil some four or six dozen in a capacious saucepan, until they become quite hard. Then, after carefully removing the shells, lay them in large-mouthed jars, and pour over them scalding vinegar, well seasoned with whole pepper, allspice, a few races of ginger, and a few cloves of garlic. When cold, bung down closely, and in a month they are fit for use. Where eggs are plentiful, the above pickle is by no means expensive.

A GREAT REFORM.—The *Dispatch* says that an order has been issued by the Postmaster-General, Mr. Holt, prohibiting all clerks leaving their duties for the purpose of "taking a drink" during office hours, under a penalty of dismissal; thus showing the determination on his part that the "sweets of office" shall not be mingled with *bitters* of any kind. The Postmaster-General is right, and shows his estimate of an *unfuddled* brain in the performance of government duty.

THE learned, after many contests, have at length acknowledged that the numeral figures, 1, 2, etc., are of Indian origin, and not Arabian, as is commonly supposed.

Patent Extension Cases.

Applications are now pending before the Patent Office for the extension of the following patents:—

Machine for Raising and Lowering Weights.—Patented by Ephraim Morris, of New York, July 5, 1845. This case is to be heard on the 20th of June next, at the Patent Office. The testimony will close on the 6th of June, and all persons opposing the extension are required to file their objections in writing twenty days before the day of hearing.

Gas Burner.—Patented by William Blake, Boston, Mass., Aug. 9, 1845. This case is to be heard at the Patent Office on the 11th of July next, and the objections must be filed twenty days before the day of hearing.

Cooking Stoves.—Charles J. Woolson, of Cleveland, Ohio. Patented Sept. 9, 1845. This cause is to be heard at the Patent Office on the 22d of August next, and the objections must be set forth, in writing, at least twenty days before the day of hearing.

Dredging Machines.—James Hamilton, of New York. Patented Dec. 16, 1845. This case is to be heard at the Patent Office on the 28th of November next, and the objections must be made in writing at least twenty days before the day of hearing.

Persons desiring copies of the claims of the above patents for examination can obtain them at this office for one dollar each.

Great Earthquake.

By late news from South America, we learn that a very destructive earthquake occurred on the 22d of March, by which the whole city of Quito was nearly destroyed, and five thousand persons killed. The shock lasted for about four minutes. The earth opened in huge rents, and was heaved up in tumultuous waves, shattering the strongest buildings, and laying them prostrate with the ground. The scene is represented to have been awful; the earth rocking, temples and towers tumbling, and the people shrieking in terror and dismay. The earthquake extended over a considerable range of country, but Quito suffered most. It is built on an extensive plain, near the mountains, and seems to be situated on the top of a huge subterranean boiling cauldron, as it has been visited several times by such calamities. That city contains about 50,000 inhabitants, and before this earthquake occurred it contained several very splendid public buildings, all of which are said to be now in ruins.

New Milk Cooler.

If milk be not cooled before is is sent by railroad, the motion of the cars is very liable either to churn it into butter, or to induce some other change which would unfit it for the special domestic use it was intended to fulfil. To prevent such an occurrence, it is usual when the milk is taken from the cow to place it in vessels that stand in water, but, as the water quickly becomes heated to the same temperature as the milk, the latter is not properly cooled.

J. Mansfield, of Jefferson, Wis., the inventor of the ingenious shower-bath, illustrated on page 168 of the present volume of the Scientific American, has produced from the recesses of his fertile brain an apparatus for cooling milk, which is the subject of our illustration.

Fig. 1 is a perspective view of the whole arrangement, Fig. 2 is a section of the cooler, and Fig. 3 a plan or top view of the same.

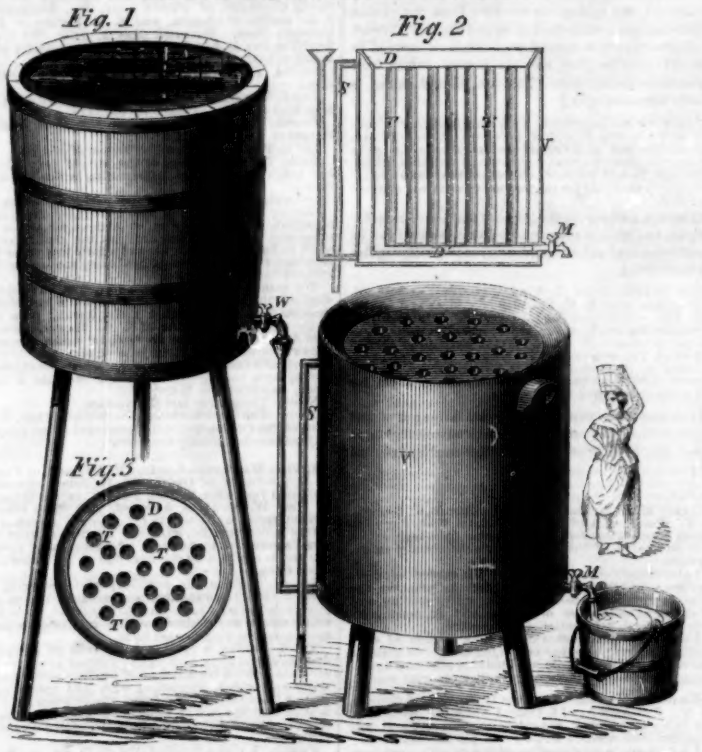
The milk is poured in the top, D, and passes down the tubes, T, to the lower part, D′, from which it runs off through the faucet, M, into a suitable pail or vessel. A current of cold water is continually circulating round the tubes in the vessel, V, the water entering at the bottom from a water receptacle, W, and gradually rising as it increases in temperature, and at last flowing off by the pipe, S. The milk is thus gradually brought to the temperature of cold spring water or, by placing ice in the water, the milk can be made colder still.

This cooler is capable of many other applications. It can be made to warm milk for making cheese, by using warm water instead of cold, and on a smaller scale would be an excellent method of cooling summer drinks, obviating the necessity of placing a piece of ice that comes from water of questionable purity into the liquid that is to be imbibed. As, by the faucet, M, the flow of the milk through the cooler can be rendered fast or slow, and the flow of water being also capable of regulation, any temperature desired can be obtained. The tubes, T, are so placed in the disks, D and D′, that they can be easily removed for repair.

Every farmer should be possessed of one of these, and hotels would find them an ice-saving and cleanly cooling device; in fact, to us, who have to endure so hot a summer, this invention should be received with a welcome.

The patent is dated Jan. 18, 1859, and the inventor will be happy to furnish any further information concerning rights, &c., upon being addressed as above, or W. Woolcock, of the same place, may likewise be applied to.

MANSFIELD'S MILK COOLER.



Zink's Cap for Trace Fastening.

The common trace fastening, whatever may be its practical merits, has no pretensions to ornament or beauty, and it cuts the traces much quicker than a careful attention to economy would seem advisable. The device which we illustrate is capable of being made highly ornamental, as it can be plated with gold or silver and engraved as elaborately as desired, it is moreover easily attached and gives "a finish" to the vehicle and harness.

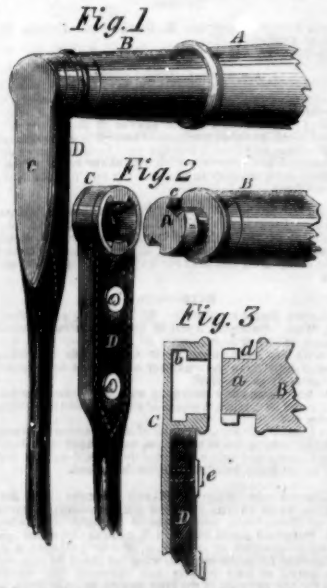


Fig. 1 shows it attached to the whiffle-tree, A, on the end of which is placed a cap, B, whose end is formed into a head, *a*, with two recesses or slots *c*, and having a circular groove *d*, running round its circumference. These parts are better seen in Figs. 2 and 3, the latter being a section. To the trace, D, is secured by rivets, *e*, a metal cap which has a groove, *b*, in it, to fit the head, *a*, and two lugs that pass through the recesses, *c*, and rest in the groove, *d*, thus forming a lock between the two, and keeping the trace from shaking off the whiffle-tree by the motion of the carriage.

The inventor of this elegant and excellent trace-fastening is A. Zink, of Lancaster, Ohio, and a patent was granted to him April 5, 1859. Dr. O. E. Davies, of the same place, and who has an interest in the patent, will be happy to furnish any further information.

Pfleghar's Punch and Awl.

In every machine-shop where belts are employed, and that is equivalent to saying in all, there has long been a want for some simple, cheap and efficient implement with which to join or sew together the ends of the belting, or to connect the ends of leather or fabrics. Our illustrations show an ingenious implement for this purpose, invented by F. P. Pfleghar, of Whitneyville, Conn., and patented by him Jan. 25, 1859.

Fig. 1 shows the whole implement, Fig. 2 the punches, and Fig. 3 the awl extended for use.

A B represent two shanks, or handles, which cross each other, and are connected by a fulcrum pin, *a*. The outer ends of the handles beyond the fulcrum pin, *a*, are the jaws, and to the jaw, C, of the handle, A, a cylindrical head, *b*, is attached by a pin or bolt, *c*, the head being allowed to turn freely on the pin or bolt. The head, *b*, is hollow or cup-form, and a series of steel tubes, *d*, are screwed radially into the head. These tubes, *d*, are of different sizes or diameters, and their outer ends are brought to a cutting edge, precisely similar to the cutting edge of the tube of an ordinary leather or shoemaker's punch. The tubes, *d*, communicate with the interior of the head, *b*.

The jaw, D, of the handle, B, is curved, or bent so as to extend below the tubes, *d*, and a bed, *e*, of copper or other soft metal, is attached to the end of the jaw, D, to serve as a bearing for the tubes, *d*. To the outer end of the jaw, D, at one end, a pin, *f*, is attached.

E is a bent bar or rod, which is secured by a pin, *g*, at its angle, *g′*, to the jaw, C, at the opposite to that where the head, *b*, is attached. This bar or rod is so bent that one part, *h*, is at right angles to the other part, *i*. The part, *h*, has its end terminating in a point forming an awl. The end, *j*, of the arm, *i*, of the bar or rod extends out at right angles to its main portion, *i*, and a fork, *k*, is attached to the part, *j*. To the part, *i*, there is attached a spring, *l*, and this spring has a plate, *m*, secured to it, the plate fitting in a slot in the end, *j*, of the part, *i*, and extending a short distance below it.

The end of the jaw, C, is made of cylindrical form, and has a recess, *n*, made in it to receive the end of the plate, *m*, when the part, *i*, of the bar or rod, E, is in a vertical position. When the part, *i*, is in such position, the implement is used as a punch, the plate, *m*, fitting in either of a series of recesses, *n*, in the periphery of the head, *b*, so as to secure the proper sized tube, *d*, directly over the bearing, *e*; the plate, *m*, in consequence of being acted upon by the spring, *l*, retaining both the bar or rod, E, and head, *b*, in the desired position. The leather, or other article or substance, is punched by passing it between the tube, *d*, and bearing, *e*, and the handles, A B, pressed together as usual. When the leather or other article is punched, the spring, *l*, is shoved outward from the head, *b*, and the plate, *m*, will be allowed to pass out of the recesses in the head and jaw, and the bar or rod, E, is turned on the pin, *g*, until the awl, *h*, projects outward from the head, *b*, and the fork, *k*, on the end, *j*, of the part, *i*, of the rod, E, catches over, or on the pin, *f*, and secures the awl in the position. The awl is used for assisting the passing of the lacing or thongs through the perforations made in the leather or fabric. Thus it will be seen that the implement is a combination of a punch and awl, and that either may be used as required. The implement is quite simple and efficient, and will prove a valuable acquisition for machine shops and factories where much belting is used for driving machinery, for belts are constantly stretching by use, and require to be "taken up" or shortened from time to time.

Any further information can be obtained from the inventor by addressing him as above.

Gold lacquer is made by dissolving gum shellac in alcohol, and coloring it with turmeric or gumboge. It is strained through a cloth before it is used, and generally takes several days to macerate.

Scientific American.

NEW YORK, MAY 7, 1859.

Enlargement and Improvement of the "Scientific American."

After the somewhat elaborate exposition of the rise, progress, and influence of the SCIENTIFIC AMERICAN which we published three weeks ago, it would be superfluous to enlarge more upon this subject at present. We may say, however, that, during the fourteen years of its existence, it has had a steady and progressive success, and a hearty support from a class of readers as intelligent as can be claimed for any other journal. It has been our aim at all times to make its columns truthful, reliable and useful; and we can point with satisfaction to the fact that not a single instance can be named wherein its independence has been purposely prostituted to subserve the private interests of any individual or corporation at the expense of principle. Occasions have not been wanting on which we have been urged to advocate schemes of questionable character; and by declining to do so, we have incurred the opposition of some of the most influential men connected with the interests of patents. Without fear or favor, however, we have pursued one independent course, as the columns of this journal bear testimony. In our advertising department we have endeavored to exercise the same rigor by uniformly rejecting what has seemed to us noxious and doubtful; so that we may assert that the integrity of our advertising patrons has been vouched for, in some degree, by the admission of their advertisements.

Our present purpose, however, is not with the past, but relates more to the present and the future. On the first point we may state that the circulation of the SCIENTIFIC AMERICAN was never larger than at this time, and the business prospects of the office were never more encouraging; and we take this opportunity to thank our numerous friends and patrons, heartily and sincerely, for their continued confidence, support and good will. There is an old adage which is both trite and forcible, and which it is safe generally to practice: "let well enough alone;" and while in the enjoyment of the almost unbounded confidence of our readers, with a circulation larger than that of any other journal of the kind in the world, and a large and constantly increasing business, we have apparently good reasons for pursuing "the even tenor of our way." *Progress*, however, is still the watchword! and after the most mature deliberation we have determined to enlarge and otherwise greatly improve the SCIENTIFIC AMERICAN, so that it shall stand alone, not only as the most useful and interesting, but also as the largest journal of its kind in the United States, and nearly equal, in the quantity of its reading matter, to the largest five-dollar scientific journal now issued in Europe. To enable us fully to carry out our designs, we have determined that the present volume shall terminate with the last number to be published in June next—No. 42—at which time the Index will be issued, and thus the numbers will be in condition for binding into a volume. In size this volume will contain nearly as many pages as any of the preceding ones, in consequence of the supplements issued during the year. The new form which we have decided to adopt will be a great improvement upon the present one, and exactly meets our views of what the SCIENTIFIC AMERICAN should be in this respect; and if it equally pleases our readers, we shall be much gratified. It will make a more convenient sheet to handle, and will possess decided advantages over the present form for binding the volume for preservation; and instead of eight pages as now, each number will contain sixteen, thus making a yearly volume of 832 pages, instead of 416 pages, which is the present number. It is our present intention to publish two volumes per year, commencing on the first days of July and January; thus affording our readers the advantages of two complete Indexes every year, and enabling them to bind their numbers either into two volumes or one, as suits their convenience. The *greatest* advantage, however, to be gained by the proposed enlargement will be the increased amount of reading matter, thus opening a wider field for the discussion of topics of vital interest to all of our readers; and as this is the most essential point of all, we shall reserve what we have to say upon this subject to a future issue. We may remark, in passing, that we are fully determined to spare neither pains nor expense to make the future of the SCIENTIFIC AMERICAN worthy of the confidence and admiration of all.

We come now to the most serious question involved in this whole matter, viz., dollars and cents. By the lowest possible estimate, which is based upon our present circulation, the increased cost of this change will amount, in the aggregate, to nearly eight thousand dollars per annum; the difference in the item of pure white paper alone will amount to six thousand dollars. Now the question we have to ask our readers is this: How shall we be remunerated for this greatly increased expenditure? Shall we increase the subscription price to $3 a year, which, if added to our present receipts, would amount to about $20,000 more than we now receive; or shall we keep it where it now is, namely, $2 a year, or, to clubs of twenty subscribers, only $1 40, which is a fraction less than three cents per single number? *We have firmly resolved not to raise the terms of subscription, but to keep them where they now are;* and we shall throw ourselves wholly upon the generosity of our readers. Will not the friends of the SCIENTIFIC AMERICAN take hold and increase its circulation on the new volume? Will not each and all of you give us a little of your time in endeavoring to procure clubs, or, if you cannot do this, get one other person to take the paper from the publishers or purchase it from the news-vender at your place of residence? We believe that our appeal *will* be heeded; and that before the commencement of the new volume in July, we shall have entered thousands of new names upon our books. The same opportunity to commence a new subscription is not likely to again occur for many years; as, at the time specified, we shall begin "Volume I., No. 1, New Series," which will be like the beginning of a new work; and as the numbers will not be stereotyped, it is important for us to know, in advance, how large an edition of the first number we shall need to print, in order to supply the demand. News-agents also should bear this fact in mind, and send in their orders accordingly.

A friend at our elbow jogs us with two pertinent inquiries, viz., "Why do you commence a new volume in *July*, instead of waiting till the usual close of the volume in September?" and "What do you propose to do with those of your present subscribers whose subscriptions will not expire till that period?" We answer, first: our volume now commences at the wrong season of the year—just at harvest, when people are generally too busy to canvass for even their favorite newspaper; aside from this, there are advantages to be gained by subscribers, under this new arrangement, growing out of the fact that most journals commence their volumes either with the year or on the first day of July, and the precise date of subscription is thus better remembered. With the above facts in view, therefore, the *second* volume of the new series of the SCIENTIFIC AMERICAN will commence on New Year's Day, 1860. Enough on this point; so now to answer the other inquiry. We intend, of course, to send our journal to all subscribers who are entitled to receive the same, until their subscriptions expire; and at that period we hope that they will all not only re-subscribe but also induce some of their friends and neighbors to do likewise. We shall aim to render the new volume so exceedingly interesting and instructive that all our old patrons and many new ones will regard the SCIENTIFIC AMERICAN as an indispensable weekly visitor.

Friends! our scheme of enlargement and improvement is partially before you; can we rely on your earnest co-operation? We believe we can; and we shall be pleased to receive suggestions touching our new volume, and also to furnish prospectuses to any and all who may feel disposed to aid us in carrying out our new project.

Science Honoring Princes.

The day was, and that not long ago, when kings and queens esteemed the votaries of science just in proportion as they believed in their capabilities for producing gold or healing the royal sickness by their knowledge of the medicinal properties of herbs or minerals. No old romance was complete without an astrologer and alchemist; the one to sit in the top chamber of a turret, surrounded by telescopes, sextants, quadrants, globes, big books and corresponding spectacles—a stuffed crocodile depending from the ceiling—calculating horoscopes, and telling fortunes for the family and country round: the other was generally located in a cellar; furnaces, alembics, retorts, a little lamp, monstrosities in bottles, and strange looking carboys, with the ever-present book and spectacles, being the furniture, and a dirty old man the philosopher, ever seeking for the grand arcana, the Elixir of Life or the Philosopher's Stone. When Royalty did visit them, it was usually to obtain a poison, or a love philter, to have a curse pronounced, or to learn the fate of an army or empire—to be told that the stars approved of their unhallowed deeds, and that they would be prosperous in their wholesale robbery. Thus the princes honored science—thus the kings patronized philosophy.

The investigation of natural phenomena inculcates patience, and patience is the forerunner of success.

Mistaken and credulous as these *savans* of old were, they laid the foundation of a system of research which has worked wonders in the world. They bore their hard lots with resignation, always working for the future, and aspiring to discover some new truth, that their names might be remembered when their patrons were buried in a deserved oblivion. And such is really the result. In this day we see the tables turned, and philosophy patronizing the prince, science honoring the noble. Dr. Faraday recently lectured in the Royal Institution, London, to an audience composed of princes and princesses, dukes and duchesses, marquises and marchionesses, lords and ladies, prelates and vicars, the remainder being common folks and their wives. The chairman was Prince Albert, the husband of England's Queen, the father of her future Kings. Thinking of nothing save the subject in hand, the professor made an eloquent appeal for experimental science, stating that it exerts an immediate and powerful influence on the progress and welfare of society. It has been fashionable for persons of all classes to consider the devotees of experimental science as a class who feel no interest in, and have no care for, the practical arts and industries of life. But this shallow and fanciful habit is heartily denounced by Professor Faraday, a man who has the best right to speak upon it. It is not alone, he tells us, for the educational benefits which arise from the study of physical phenomena and laws that he and others pursue their scientific inquiries. These benefits are undoubtedly valued, and are felt to be of themselves worth far more labor than is bestowed on their acquisition. But in addition to these, the experimentalist looks with pride upon those practical fruits which his devotion has fostered, and with confidence anticipates like harvests for the future. The steam-engine, the electric telegraph, and other world-transforming and world-bettering agencies declare his honor, and it is folly to suppose him insensible to the fact.

Notwithstanding that our sphere is more with the practical than the abstract, we would not for one moment deny the utility of the abstract, or oppose the statement that it is the very life of the practical; and such men as Faraday, Agassiz, Wagner, and others, we truly honor and esteem. To come back to our title, let us suggest two subjects for cartoons to decorate, in color or in print, the palace of the rich and the home of the poor—

GALILEO AND THE INQUISITION, 1615.

FARADAY AND PRINCE ALBERT, 1859.

Wanted by Government!

The government of the United States, not unlike those of some other countries, pursues a somewhat blind system of making known its wants; therefore few of our enterprising citizens understand how varied are the needs of the different departments of its service. The system in vogue is one universally known under the familiar phrase of "kissing goes by favor;" hence we see that, if the extension of a patent is desired to be obtained, or if candles, beeswax or mustard, are wanted for the army or navy, the government organ must needs be the medium of making known these facts; and as a natural result of this blind system of procedure, few comparatively, save hungry politicians, know anything about the matter. Now, we do not object to the government organ, neither do we purpose to interfere with its patronage, for we want no such advertising; but we insist upon it that it would be for the interest of both government and constituent, if a more comprehensive policy were pursued. We find in a recent issue of the *Constitution*, published at Washington, several advertisements of applications for the extension of patents, which are noticed elsewhere, and but for which few interested in them would know of such applications; also, "proposals," issued under authority of the navy, for certain supplies; thus, for instance, the Bureau of Construction wants over eight hundred lanterns for marine purposes. The Bureau of Provision and Clothing wants boxes, brushes, buttons, blacking, combs, beeswax, jack-knives, razors, strops, scissors, spoons, grass for hats, tape, thimbles, needles, soap, candles, mustard seed, black pepper, bottles, corks, &c. Here is a chance for the competition and reward of honest industry, and if government could but get direct access to our workshops, and thus avoid all unnecessary circumlocution, it would save a vast amount in brokerage, and there would be less need of investigating or "white-washing" committees.

Telegraphs in the West Indies.

The first line of electric telegraph in the island of Porto Rico was inaugurated at Aroyo on the 1st of last month, by Professor Morse, who has been sojourning in the West Indies during the past winter. On that occasion the authorities of the town gave him a public breakfast, at which there were present a great number of the dignitaries of the island, who paid the professor some very high compliments.

THE COMMISSIONER OF PATENTS.—No appointment has as yet been made to fill this office. The Providence *Journal*, in speaking of the probability that Hon. Wm. D. Bishop, ex-Member of Congress from Connecticut, had been appointed, says that "fortunately for the public service he is a man of excellent abilities, and will doubtless fill, to the general satisfaction, the very important position to which he has been assigned. There is a propriety, too, in selecting the head of the Patent Office from a State conspicuous for its inventive genius."

CANADIAN CENTS.—These coins, which have been lately thrown off at the British Mint, possess a remarkable peculiarity. They are not only tokens of value, but also standards of weight and measure. One hundred cents weigh exactly one pound, and one cent measures one inch.

Advice about Lightning.

It is calculated that at least fifty persons are killed by lightning every year in this country, and as the season is approaching when casualties of this kind are imminent, a few words of advice and caution upon the subject may serve as a safeguard, if carefully observed.

During the prevalence of a recent thunder-storm which visited the town and vicinity of St. Petersburg, Ill., two men were suddenly killed by a stroke of lightning, which decended the chimney of the house in which they were residing. One of the unfortunate victims was in the act of winding a clock that stood on the mantlepiece, and the other was standing immediately behind him, when both were struck lifeless. Two women were at the same time sitting in the room and escaped injury, as they happened to be seated some distance from the chimney.

When the lightning's flash and the thunder's crash are seen and heard almost simultaneously, it is a sign that danger is at hand, and the next bolt may strike the tenement which affords us shelter. To know the place of greatest safety upon such an occasion is important knowledge. This science clearly teaches us, and as a faithful monitor, its voice should be heard with attention,

The earth and atmosphere are saturated with electricity, which ordinarily remains in a state of equilibrium. When this condition is disturbed we have the phenomena of thunder-storms—which is simply an effort of nature to restore the electric equilibrium between the atmosphere and the earth. The atmosphere in such cases is converted into a huge Leyden jar; the lightning is simply disruptive discharges through the intervening air; and thunder is the sound caused by the violent and sudden compression of the air-producing waves, hence the long continued roll like the discharge of artillery. Lightning is the most subtile and irresistible power of nature. A single flash can shiver the tall mast of a war-ship that might bid defiance to a cannonade, or rend the lofty oak of the forest to splinters in an instant; and a single bolt has toppled the tall church spire to the dust in the twinkling of an eye. What is the puny power of man before such a mighty agent? It is physically frail as a feather or a trembling leaf. Armed in the panoply of science, however, man, like a weak but skillful general, can manœuver his forces against this otherwise destructive power, and convert danger into comparative safety.

This discovery was made when Franklin proved the identity of lightning and electricity with his little kite. Electricity possesses the peculiar property of flowing quietly along or through what are called "conductors," such as copper, gold, iron, &c.; and taking advantage of this, the American philosopher suggested the erection of tall rods of iron or copper on houses and ships, to *tap* the Leyden jars of the atmosphere, and convey their charges quietly and safely to the earth. This suggestion carried out has saved thousands of lives and millions' worth of property, hence all houses should be provided with such conductors; but as is the case now, perhaps the great majority of buildings will always be unsupplied with such agencies. In all such cases, it should never be forgotten that the lightning always seeks to pass to the earth by the nearest prominent conductors, hence we have an explanation of the cause why trees, masts of ships, steeples of churches, towers, and chimneys are so often struck, and why the persons referred to above should not have been standing so near the fire-place on the occasion of a thunder storm which cost them their lives. In such storms, persons in houses should sit or lie in some place as far distant as possible from the chimney, and the most exposed parts of the walls—the middle of the room, if it is large, is the safest locality. Sailors on the sea should keep as far from the masts as possible, and farmers in the fields should never seek shelter under trees. Horizontal strokes of lightning sometimes take place, and several persons have been struck while sitting at open windows during thunder-storms. Every window of a room in which persons are sitting, in such cases, should be closed; a flash of the fluid, which would pass through an open window into an apartment, will be conducted down through the floor and wall to the earth if the window is shut. We have thus given some directions to be followed by all persons during the prevalence of lightning, and we have set forth the science of the question, so that all may not only see the reasonableness of our remarks, but their seasonableness also.

Making Perfume.

Have any of the uninitiated ever had any idea how perfumes are obtained from flowers? It is to many a mystery, an occult art, a pretty kind of alchemy, a mild witchcraft. There is a rough notion of machines like miniature wine-presses, where the flowers were squeezed, and bruised, and mangled, and made to give up their perfumes in a rude masterful manner; though it is puzzling to think how mignonette, or sweet pea, or any other flower which loses its odor when crushed or dead, could be treated thus to any advantage.

There are, it appears, four modes of obtaining the perfume of plants and flowers, The first is by expression—a mode only adopted when the plant is very prolific in its volatile or essential oil; that is, in its odor. The outer rind or pellicle of the lemon, orange, citron, and a few others of the same class, is chiefly subjected to this process. The parts to be expressed are put into a cloth bag, and placed under a screw press; sometimes laid, without any bag at all, on the perforated plate through which the oil is to run. When all the oil is expressed, it is left standing in a quiet place for some time, to allow it to separate itself from the water which came with it. It is then poured off and strained.

The second method is by distillation—a method used for lavender, cloves, seeds, herbs, but not for the rarer flowers, the odors of which are lost by heat; only to be gained indeed by loving contact and careful influence. The only notable fact in this process of distillation is that, in France, they apply fire directly to the still; in England, they distil by steam. Excepting for this difference, this mode of chemical manipulation is too well known to need description here. The fire applied directly to the still sometimes gives a burnt odor to the distillate, which is not entirely disagreeable in some combinations.

Maceration is the third process. Purified beef or deer suet is placed with purified lard in a clean metal or porcelain pan or steam bath. When melted, the flowers required to be used are thrown in and left to remain from twelve to forty-eight hours; the liquid fat is then strained, and fresh flowers added, This is repeated as often as is necessary; and the pomatum obtained therefrom is known as six, twelve, eighteen, or twenty-four, according to the strength of the odor. For perfumed oil the same process is gone through; fine olive oil only being substituted for lard and suet. Orange, rose, and cassie, are prepared thus; violet and réséda are begun thus, and finished by enfleurage.

This is the daintiest method of all. Enfleurage, or absorption, is very little practiced in England, though uniformly used in France for all the finest odors. Square frames with glass bottoms are spread with a layer of fat about a quarter of an inch thick; and then sprinkled abundantly with flowers. They are suffered to remain forty-eight hours, when a fresh supply of the spent and exhausted blossoms is given; which process is repeated over and over again until the pomatum is sufficiently powerfully scented. For perfumed oil, coarse cotton cloths are saturated with fine olive oil, and laid on frames of wire gauze. These are treated in the same manner as the above; and, when thoroughly perfumed, are placed under a screw press and the oil wrung from them—rich flowery oil, such as Juno or Venus might have used, and been proud of, too.

Odors are extracted from various parts of plants or flowers; different in different kinds. The roots of orris and of vitivert; the stem or wood of cedar, santal and rosewood; the leaves of mint, thyme, and patchouli; the flowers of roses, violets, and other flowers; the seeds of the Tonquin bean, and carraway, the bark of the cinnamon; many gums and resins—benzoin, olibanum, &c.; these are a few instances of the various odoriferous parts of different plants. Some indeed are more varied in their odoriferous elements. For instance, the orange-tree gives three distinct scents, and most flowers give two, according to their manner of preparation. From the leaves of the orange-tree, comes petit-grain; from the flowers, neroli; from the rind, the essential oil known as Portugal. Again the orange flower or neroli, macerated in pomade is known as orange-flower pomatum. This, chopped up fine and put in rectified spirit, makes extrait de fleur d'orange, which is one of the most valuable bases to the perfumer—passing, with slight modifications, for sweet-pea, magnolia, and scents of that class. Orange-flowers distilled with water give the otto known as oil of neroli. The petit-grain, a quite different odor, is extracted from the leaves and the young unripe fruit of various species of citrons, and is used for scenting soaps. The neroli petale and bigarade help to form Hungary-water and eau de Cologne. The water which was used in distilling the oil of neroli, when freed from oil, is eau de fleur d'orange, a cheap and fragrant cosmetic of three qualities. The first is made from the distilled flowers; the second, of the water used in distilling the oil of neroli; and the third from the leaves, stems, and young unripe fruit of every kind of orange-tree. They are easily tested; the first turning rose-color under a few drops of sulphuric acid; the second turning rose-color, too, when quite fresh; but, after a short time this chemical result and the aroma both disappear; the third does not change its color at all under sulphuric acid, and smells more of lemon than of orange.

Who does not know the magic virtues attributed to almond-paste? But the largest amount of the almond perfume of commerce comes from distilled laurel leaves and the kernel of stone-fruit; also from the skin of bitter almonds. The essential oil of almonds is got from the nut itself; first pressed into a cake, then moistened with salt and water; from the fermentation of this is produced the amygdalin and emulsine contained in the almonds. Laurel leaves and other analogous substances give the same results under the like treatment. Fourteen pounds of almond-cake yield one ounce of essential oil, which must then be diluted with spirit to become pleasant, the concentrated essence being too powerful to be tolerable. It is much used in soap, cold cream, &c., being esteemed as a good cosmetic. Mirabane is imitated oil of almonds, made from benzole (a product of tar oil), and patented by Mr. Mansfield, of Weybridge, England. This mirabane was used for perfuming soap; but it did not succeed, and, after a short time, the licence was withdrawn, since when miribane or, chemically speaking, nitro-benzole, has not been applied to any of the general uses of perfumery.—*S. Piesse.*

SCIENCE AND SOAP.—We refer to the fact, in another article, that the government is calling for soap. Here, it seems to us, is a rare chance for Professor Gardner, the famous New England soapman, to visit Washington, assemble the officials who contract for soap, and proclaim in their ears, in his own peculiar manner, the virtues of soap and cleanliness. Uncle Sam and all his official family would be astonished to hear that there is not only virtue in soap, but also science and wit.

A remarkable pillar of light, resembling the tail of a large comet, swept from northeast to northwest over the city of New York on the 29th ult.

Notes and Queries

*** PERSONS who write to us expecting replies through this column, and those who may desire to make contributions to it of brief interesting facts, must always observe the strict rule, viz., to furnish their names, otherwise we cannot place confidence in their communications.

WE are unable to supply several numbers of this volume; therefore, when our subscribers order missing numbers and do not receive them promptly, they may reasonably conclude that we cannot supply them.

J. A. S., of Miss.—There is no new work on the high pressure steam-engine published. The most complete work on the subject is "Tredgold on the Steam Engine," a London publication, and very dear.

J. B. B., of Fla.—We would be happy to receive a description of your electric wind vane. We advise you to connect the wires with the ground for safety; it will do no harm, while it will ensure confidence. Mr. Sherry, of Sag Harbor, L. I., we believe, will furnish you with such a clock as you want on reasonable terms.

A. T., of Ill.—There is no publication devoted specially to type-founding in this country or in England. "The Printer," published by Henry & Huntingdon, this city, contains considerable information on the subject. Several works on printing have been published. Joel Munsell, printer, of Albany, N. Y., has quite a large library of books relating to this art.

R. & G., of Md.—There would be scarcely a limit to the value of a motor that would supersede steam with the economical results you mention.

W. R. H., of Texas.—We regret that we cannot send you No. 52 of the last volume. We are out of that number. A mixture of sulphur, phosphorous and camphor burned in anthills will generate a heavy gas, that will be likely to kill the insects.

J. T., of Del.—We advise you to put a coat, one inch thick, of boiled pitch and asphalt cement on your leaky roof; it should be laid on hot, contain 20 per cent of sand and should be covered with air slacked lime or marble dust, and on the top of all some fine white gravel.

H. I., of N. Y.—A common opinion prevails that the ocean cannot be sounded; this is a mistake, for the whole Atlantic has been sounded from America to Europe in latitude 59°. The water in your dam will flow back just as far with a 100 feet diagonal breast as a 50 feet straight breast. The hight of the wall or breast determines the back-flow, not the length of it.

L. Hatfield, Cuyahoga Falls, Ohio, wishes to correspond with a manufacturer of mowing machine knives.

J. S. N., of Pa.—Common gum copal varnish will stand exposure to rains for one season at least, and is transparent but not white. Linseed oil, boiled down until it is of a creamy consistency, makes a very durable transparent varnish, which will last for two or three seasons exposed to the weather.

S. C., of Va.—To obtain a correct knowledge of chemistry, you should commence and study a good elementary work and experiment. Get Gregory's or Kane's elements of chemistry to commence with.

B. P. R., of N. Y.—The mineral which you have sent us from Washington County is galena. If fuel is cheap and abundant it may be profitably smelted for its lead. It contains no silver of any consequence.

W. A. L., of N. Y.—What more information do you want in regard to concrete houses than the article to which you have referred?

J. P. W., of Ill.—Address Wiley & Halsted, booksellers, of this city, in reference to a work on architectural drawing.

J. W. B., of Tenn.—H. C. Baird, of Philadelphia, has issued a work on brewing and distilling, which also contains information about yeast-making.

H. S., of Pa.—A depilatory powder for removing hair can be made of slacked lime in powder, three ounces, orpiment, half an ounce, mixed with water to the consistence of cream. Apply it with a rag or brush, and allow it to remain on for five minutes.

R. W., of Mich.—Bricks glazed on the outside have been proposed several times, and no doubt they would be excellent to prevent moisture entering from the outside.

L. J. O., of Wis.—We are not acquainted with the practical operation of the coal oil lamp to which you refer.

W. H., of Ill.—Your proposed method of navigating the atmosphere is impracticable. You seem to suppose that by making a spherical vessel to contain 100,000,000 cubic feet of air, then pumping this out, that it will "go off and up like a bird." You also propose to build an iron vessel 1000 feet long and 500 feet in diameter to carry out your ideas. If you do so, and extract the air from it by a pump, its sides will be crushed in like pasteboard, as the outside pressure will then be 15 lbs. on the square inch.

S. M. M., of Iowa.—The substance of your letter may be summed up in the following words: "There is no general rule for determining accurately the amount of friction which a steam-engine consumes on itself." If all engines were made alike, one rule could be applied to all, not otherwise. A steam-engine can be constructed which will not consume more than one-twentieth of its power in friction.

L. K. H., of Wis.—If you turn to page 262, No. 33 of the SCIENTIFIC AMERICAN, you will find information about license laws of States which fully answers your question. If you employ a patent process in tanning leather you are not obliged to stamp the date of the patent on the leather. The process, and not the leather, is the subject of the patent.

W. A. F., of ——.There is no chance for a patent on your marine governor. The same thing has been oftentimes proposed to us. We have no confidence in its value as an operating device.

D. E., of Conn.—We certainly cannot advise you to apply for a patent on your alleged improvement in apparatus for generating power. Your ideas are based upon a misconception of the laws of motion. You are only deceiving yourself, and wasting time and money on a visionary project.

Money received at the Scientific American Office on account of Patent Office business, for the week ending Saturday, April 30, 1859 :—

J. E. C., of Me., $25; G. Van C., of N. J., $30; J. A. of Ky., $30; N. & C., of Wis., $30; J. P., of N. H , $30; C. L. R., of Pa., $30; D. W., of L. I., $30; T. B. C., of Del., $37; H. H. L., of R. I., $10; S. W., of Pa., $25; R. N. B., of N. Y., $35; J. C. C., of Pa., $45; D. H., of Ill., $25; D. S., Mass., $30; E. E. M., of N. Y. $200; D. L., of Mass., $25; M. B., of N. Y., $30; R. W. C., of N. Y., $30; J. K., of O., $35; O. E. W., of Pa., $55; W. S. M., of N. Y., $110; M. R. F., of N. Y., $50; D. & D., of L. I., $30; E. L. G., of Ct., $25; I. S., of Ill., $30; T. J. W., of Me., $30; D. H. VanD., of N. Y., $25; O. S. S., of Ct., $25; G. S., of N. Y., $25; E. G. C., of Wis., $25; H. & T., of N. Y., $30; P. & B., of Iowa, $30; L. & J., of N. Y., $30; W. H. B., of Iowa, $30; H. G., of N. Y., $25; F. T., of N. Y., $25; W. C., of Mass., $55; G. F., of of L. I., $55; E. T. Q., of N. H., $30; S. C. T., of Cal., $10; J. F. C., of Ct., $25; McN. & G., of Pa., $20; H. W. D., of N. Y., $30; T. B. F., of S. C., $30; E. T. S., of Cal., $35; G. R. H., of Mo., $12; J. W., of Mass., $30; D. V., of N. Y., $30; J. G. S., of N. Y., $10; W. D. B., of Mo., $45; C P. P., of Ala., $20; M. K., of N. Y., $25; J. D. F., of Iowa, $25; J. F., of Mo., $150; G. & M., of Pa., $30; J. W. H., of N. C., $60; C. & N., of O. T., $50; J. C., of Pa., $25; D. C. S., of N. Y., $25; J. G., of N. Y., $30; E. P. P., of Ala., $20; E. B., of N. Y., $25; R. R., of Vt., $30; J. G., of Pa., $30; H. A., of Fla., $35; L. W., of Iowa, $40.

Specifications and drawings belonging to parties with the following initials have been forwarded to the Patent Office during the week ending Saturday, April 30, 1859 :—

M. K. of O.; J. D. F. of Iowa; W. C. G. of Ct.; J. McC. of N. J.; S. W. of Pa.; D. H. Van D. of N. Y.; J. G. B. of Ill.; G. F. of N. Y.; W. S. M. of N. Y.; (3 cases) C. G. C. of Wis.; A. & H. of Ct.; W. & K. of N. Y.; J. W. T. of Vt.; H. G. of N. Y.; M. K. of N. Y.; W. H. of Ill.; O. S. S. of Ct.; J. F. C. of Ct.; D. J. O. of Pa.; D. L. of Mass.; E. B. of N. Y.; G. S. of N. Y.; G. & M. of Pa.; F. T. of N. Y.; J. E. C. of Me.; T. H. of N. Y.; T. B. C. of Del.; T. B. F. of S. C.; E. L. G. of Ct.; H. H. L. of R. I.; H. A. of Fla.; G. R. H. of Mo.; T. T. C. of N. Y.

IMPORTANT TO INVENTORS.

AMERICAN AND FOREIGN PATENT SOLICITORS.—Messrs. MUNN & CO., Proprietors of the SCIENTIFIC AMERICAN, continue to procure patents for inventors in the United States and all foreign countries on the most liberal terms. Our experience is of thirteen years' standing, and our facilities are unequaled by any other agency in the world. The long experience we have had in preparing specifications and drawings has rendered us perfectly conversant with the mode of doing business at the United States Patent Office, and with most of the inventions which have been patented. Information concerning the patentability of inventions is freely given, without charge, on sending a model or drawing and description to this office.

Consultation may be had with the firm, between nine and four o'clock, daily, at their principal office. 37 Park Row, New York. We established, over a year ago, a Branch Office in the City of Washington, on the corner of F and Seventh streets, opposite the United States Patent Office. This office is under the general superintendence of one of the firm, and is in daily communication with the Principal Office in New York, and personal attention will be given at the Patent Office to all such cases as may require it. Inventors and others who may visit Washington, having business at the Patent Office, are cordially invited to call at our office.

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Inventors will do well to bear in mind that the English law does not limit the issue of patents to inventors. Any one can take out a patent there.

Circulars of information concerning the proper course to be pursued in obtaining patents through our Agency, the requirements of the Patent Office, &c., may be had gratis upon application at the principal office or either of the branches.

The annexed letters from the last two Commissioners of Patents we commend to the perusal of all persons interested in obtaining patents :—

MESSRS. MUNN & CO.—I take pleasure in stating that while I held the office of Commissioner of Patents, MORE THAN ONE-FOURTH OF ALL THE BUSINESS OF THE OFFICE came through your hands. I have no doubt that the public confidence thus indicated has been fully deserved, as I have always observed, in all your intercourse with the Office, a marked degree of promptness, skill, and fidelity to the interests of your employers.

Yours, very truly, CHAS. MASON.

Immediately after the appointment of Mr. Holt to the office of Postmaster-General of the United States, he addressed to us the subjoined very gratifying testimonial :—

MESSRS. MUNN & CO.—It affords me much pleasure to bear testimony to the able and efficient manner in which you discharged your duties as Solicitors of Patents while I had the honor of holding the office of Commissioner. Your business was very large, and you sustained (and, I doubt not, justly deserved) the reputation of energy, marked ability, and uncompromising fidelity in performing your professional engagements.

Very respectfully, your obedient servant,

J. HOLT.

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A MESSIEURS LES INVENTEURS.—Avis Important.—Les inventeurs non familiers avec la langue Anglaise, et qui prefereraient nous communiquer leurs inventions en Francais, peuvent nous addresser dans leur langue natale. Envoyez nous un dessin et une description concise pour notre examen. Toutes communications seront recues en confidence. MUNN & CO. Scientific American Office, 37 Park Row, New York.

Zur Beachtung für Erfinder.

Erfinder, welche nicht mit der englischen Sprache bekannt sind, können ihre Mittheilungen in der deutschen Sprache machen. Skizzen von Erfindungen mit kurzen, deutlich geschriebenen Beschreibungen belieben man zu adressiren an

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CALIFORNIA AGENCY FOR PATENTS—WETHERED & TIFFANY, San Francisco, will attend to the sale of patent rights for the Pacific coast. References :—Messrs. Tiffany & Co., New York; Wethered, Brothers, Baltimore; George W. Bond & Co., Boston. 23 13*

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HYDRAULIC JACKS OF 15, 20, AND 25 Tuns power—Prices, $100, $115 and $130 each. Hydraulic Presses of 15 tuns power, price $150. For sale by JAMES O. MORSE & CO., 76 John and 29, 31 and 33 Platt sts., New York. 26 3mos*

Science and Art.

Science of Things Familiar.

Why is rain water soft? Because it is not impregnated with earth and minerals.

Why is it more easy to wash with soft water than with hard? Because soft water unites freely with soap and dissolves it, instead of decomposing it as hard water does.

Why do wood ashes make hard water soft? 1st, Because the carbonic acid of wood ashes combines with the sulphate of lime in the hard water, and converts it into chalk; 2d, wood ashes also convert some of the soluble salts of water into insoluble, and throw them down as a sediment by which the water remains more pure.

Why has rain water such an unpleasant smell when it is collected in a rain tub or tank? Because it is impregnated with decomposed organic matters washed from the roofs, trees, or the casks in which it is collected.

How does blowing hot foods make them cool? It causes the air which has been heated by food to change more rapidly, and give place to fresh cold air.

Why do ladies fan themselves in hot weather? That fresh particles of air may be brought in contact with their face by the action of the fan; and as every fresh particle of air absorbs some heat from the skin, this constant change makes them cool.

Does a fan cool the air? No, it makes the air hotter, by imparting to it the heat from our face; but it cools our face by transferring its heat to the air.

Why is there always a strong draft under the door and through the crevices on each side? Because cold air rushes from the hall to supply the void in the room caused by the escape of warm air up the chimney, &c.

Why is there always a strong draft through the keyhole of a door? Because the air in the room we ocupy is warmer than the air in the hall; therefore the air from the hall rushes through the keyhole into the room, and causes a draft.

Why is there always a draft through the window crevices? Because the external air, being colder than the air of the room we occupy, rushes through the window crevices to supply the deficiency caused by the escape of the warm air up the chimney.

If you open the lower sash of a window there is more draft than if you open the upper sash. Explain the reason of this. If the lower sash be open, the cold external air will rush freely into the room and cause a great draft inward; but if the upper sash be open, the heated air of the room rushes out, and, of course, there will be less draft inward.

Why is a room best ventilated by opening the upper sash? Because the hot vitiated air, which always ascends toward the ceiling, can escape more easily.

By which means is a hot room more quickly cooled—by opening the upper or lower sash? A hot room is cooled more quickly by opening the lower sash, because the outer air can enter more freely into the lower part of the room where it is colder.

Why does the wind dry damp linen? Because dry wind, like a dry sponge, imbibes the particles of vapor from the surface of the linen as fast as they are formed.

Which is the hottest place in a church or chapel? The gallery.

Why is the gallery of all public places hotter than the lower parts of the buildings? Because the heated air of the building ascends, and all the cold air which can enter through the doors and windows keeps to the floor till it has become heated.

Improved Pump.

The prosperity of a nation may in some measure be estimated by the regard which that nation has for water, the almost universal liquid, and to which man owes so many blessings. Do the streams, hurrying from the mountains to be engulfed in the sea, meet water-wheels on their way? then there is prosperity. Do houses on hills have plenty of water from the valleys? then there is civilization. No people think more of contrivances for raising water or using the power of falling water than ourselves, and a good illustration of the fact is, that inventors are always producing something new and improved in these classes of machines. Such a one is the subject of our engraving, being a pump without suction or packing, and it is the invention of John Powers, of this city, to whom a patent was granted April 5, 1859.

"THE AMERICAN PUMP."

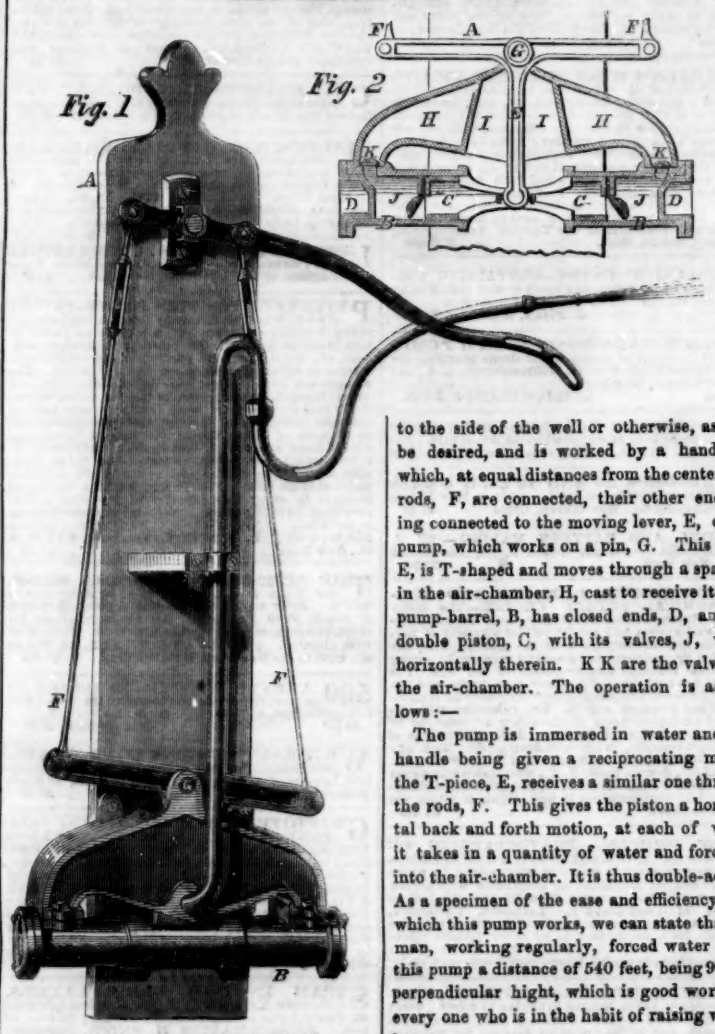


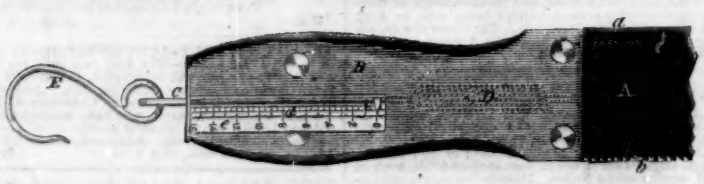
Fig. 1 is a perspective view and Fig. 2 a section of the working parts, which we will now proceed to explain.

The pump is attached to a board, A, secured to the side of the well or otherwise, as may be desired, and is worked by a handle, to which, at equal distances from the center, two rods, F, are connected, their other ends being connected to the moving lever, E, of the pump, which works on a pin, G. This lever, E, is T-shaped and moves through a space, I, in the air-chamber, H, cast to receive it. The pump-barrel, B, has closed ends, D, and the double piston, C, with its valves, J, works horizontally therein. K K are the valves of the air-chamber. The operation is as follows:—

The pump is immersed in water and the handle being given a reciprocating motion the T-piece, E, receives a similar one through the rods, F. This gives the piston a horizontal back and forth motion, at each of which it takes in a quantity of water and forces it into the air-chamber. It is thus double-acting. As a specimen of the ease and efficiency with which this pump works, we can state that one man, working regularly, forced water from this pump a distance of 540 feet, being 97 feet perpendicular hight, which is good work, as every one who is in the habit of raising water, knows.

Any further information can be obtained by addressing J. M. Edney, 147 Chambers street, New York City.

SMITH'S BALANCE, KNIFE AND SAW.



We could not help thinking, while examining the subject of our illustration, what a convenient thing it would have been for that Shylock of "pound-of-flesh" memory. Instead of the actor carrying (as he does now) a pair of scales at his girdle, the like of which were *never* seen in Venice, let him in future have this balance, knife and saw, suspended to his gaberdine, and he will look the amateur butcher that he wishes to be.

This is really a sensible invention and deserves to quickly come into general use; it is simply a knife, A, with an edge, *a*, and saw-back, *b*, or any knife without a saw-back. In the handle, B, a spring, D, is secured and to this a bar, C, is attached and a hook, E; a pointer, *c*, projects through a slot, *d*, in the handle and marks the weight on the graduated scale, *e*. This scale and pointer may be dispensed with, and the pounds and ounces marked on the bar, C, the bottom of the handle serving as an index. The spring balances are cheap and will not materially increase the cost of the knife, so that every family can possess one, for they are not intended for the exclusive use of the butchers and grocers, although they will be glad of such a useful and time saving device.

The inventor is Geo. H. Smith, of Glenwood, Iowa, and it was patented Sept. 15, 1858. Any further information can be obtained by addressing the inventor or Bernard C. Meyer, 347 Broadway, New York City.

The Patent Office.

We learn that the United States Patent Office at this moment exhibits a degree of activity never exceeded since the period of its organization; that the revenues during the past quarter were greater than had ever been realized in an equal space of time; that the facility in the dispatch of business, acquired by enlarged experience and the stimulus of success, has likewise increased; and that there is a daily growing demand upon its services. This intelligence is gratifying when regarded simply as showing the satisfactory progress of an important branch of one of the departments of the government; but when we remember that the history of the Patent Office, reviewed in connection with the financial history of the country, renders it apparent that no branch of enterprise and industry is more sensitive to the influence of depressing causes, we have reason to rejoice in the facts here related, as evincive of the spirit of the people and of their buoyant hopefulness and general prosperity. It is also observable, as we are informed, that the character of the discoveries and improvements for which patents are claimed are generally, both in the ingenuity exhibited and the utility of the purposes designed to be accomplished, of a character calculated to afford an argument in favor of the advancement of the intelligence and scientific appreciation of the country. This, we are assured, is particularly shown in the increased attention given to the subject of chemistry in its application to manufactures, the mechanic arts and agriculture, as well as to the processes of the laboratory itself—a field probably opening a wider and more inviting range for discovery than any other to which the inventive genius of our citizens is applied. —*Washington Constitution, April* 14.

A Good Story.

A correspondent and old subscriber to the Scientific American, who lives in Iowa, sends us the following amusing anecdote:—

"A few weeks since, my little boy was at a neighboring village where he saw a man selling rights for a patented machine. He asked a gentleman what part of the machine was patented;' to which the vender answered 'The whole thing.' 'I guess not,' said the boy, 'for there are many parts which are not new or patentable.' 'How do you know about patents and machines, boy?' said the surprised patent-vender. 'Sir,' replied the boy, 'my father has taken the Scientific American for thirteen years, and I learn by that not to be fooled by itinerant patent peddlers.'"

That was something like a boy! and we hope that many boys will imitate him by reading the Scientific American, and that many fathers will take it for their boys to read.

MECHANICS

INVENTORS, MILLWRIGHTS, FARMERS AND MANUFACTURERS,

FOURTEENTH YEAR

PROSPECTUS OF THE

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